Metal and Nonmetal National Mine Rescue Contest Rules

U. S. Department of Labor
Mine Safety and Health Administration

2004

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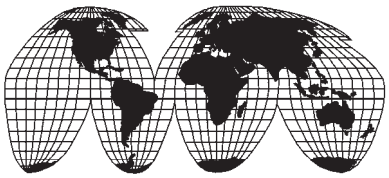

Metal and Nonmetal National Mine Rescue Contest Rules

U. S. Department of Labor
Elaine L. Chao
Secretary

Mine Safety and Health Administration
Dave D. Lauriski
Assistant Secretary

2004

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PREFACE

This booklet was prepared for mining industry instructors, MSHA instructors and inspectors to train mine rescue teams, judges, and contest personnel in procedures for a mine rescue contest. Reference to specific brands, equipment, or trade names is made to facilitate understanding and does not imply endorsement by the Mine Safety and Health Administration.

MISSION STATEMENT

The Metal and Nonmetal National Mine Rescue Contest serves as a training tool to improve the skills required to respond to a mine emergency. The National Contest Rule Book establishes procedures and rules that serve to guide the rescue teams in actual situations. This competition serves to strengthen cooperation between mining companies, equipment manufacturers, Federal and State agencies to enhance mine rescue preparedness.

ACKNOWLEDGMENTS

A special thanks to the National Metal and Nonmetal Advisory Committee for their valuable assistance in preparing this booklet. The Advisory Committee consists of:

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The following organizations are recognized for the resources and personnel they committed in support of the biannual National Metal and Non-metal Mine Rescue Contest.

Biomarine, Inc.

Central Mine Rescue Unit

CSE Corporation

Draeger Corporation

Joseph A. Holmes Safety Association

Industrial Scientific Corporation

Kansas Mine Rescue Association

Missouri Mine Rescue Association

Mine Safety Appliances Co.

National Mine Rescue Association

Northern Mine Rescue Association

Southern Mine Rescue Association

Southwestern Mine Rescue Association

Southwestern Wyoming Mutual Aid Association

2002 NATIONAL MINE RESCUE CONTEST CHAMPIONS

FMC

FMC Westvaco Mine
FMC I. . . . . Green River, Wyoming
Bob Knott (Captain)
Rick Owens (Gas)
Glen Weinmaster
Robert Pope
Leroy Hutchinson
Al Jones (Gas)
Melvin Lovato
Bill Oleson
Mike Padilla (Team Trainer)
Dave Hutchinson (Team Trainer)
Robert Pope (First Aid)
Melvin Lovato (First Aid)
Bill Oleson (First Aid)
Rick Steenberg, Mine Manager
(Official in charge)

(Kneeling left to right) *Robert Pope, Anthony Herrera, Leroy Hutchinson, Bob Knott, Glen Weinmaster, Mike Padilla*
(Standing left to right) *Rick Owens, Al Jones, Melvin Lovato, Bill Oleson, Dave Thomas*

PREVIOUS NATIONAL CHAMPIONS

2000 Big Island Mine, OCI Blue Team, OCI of Wyoming, L.P. - Green River, WY

1998 FMC Mine, Red Team, FMC Corporation - Green River, WY

1996 Big Island Mine, White Team, OCI of Wyoming, L.P. - Green River, WY

1994 Waste Isolation Pilot Project, Blue Team, Westinghouse Electric Corporation - Carlsbad, NM

1992 Big Island Mine, White Team, Rhone Poulenc of Wyoming - Green River, WY

1990 Magmont Mine Team, Cominco American - Bixby, MO

1988 Homestake Mine, Gold Team, Homestake Mining Co. - Lead, SD

1986 Big Island Mine, White Team, Stauffer Chemical Co. - Green River, WY

1984 Texasgulf Mine, Gold Team, Texasgulf Chemicals Co. - Granger, WY

1982 Big Island Mine, Blue Team, Stauffer Chemical Co. - Green River, WY

1980 Lisbon Mine Team, Rio Algom Corp. - Moab, UT

1978 Jefferson Island Mine Team, Diamond Crystal Salt Co. - New Iberia, LA

1976 Magmont Mine Team, Cominco American - Bixby, MO (Single-Level Contest)

1976 Magmont Mine Team, Cominco American - Bixby, MO (Multi-Level Contest)

1975 Big Island Mine, White Team, Stauffer Chemical Co. - Green River, WY

1973 Grand Saline Mine Team, Morton Salt, Division of Morton Norwich Products, Inc. - Grand Saline, TX

2002 NATIONAL MINE RESCUE BENCHMAN'S CONTEST CHAMPIONS

BG-4 CONTEST

LESLIE WAREHAM
General Chemical Corporation
General Chemical Mine
Blue Team . . . . . Green River, Wyoming

BG-174A CONTEST

DENISE RICH
Stillwater Mining Company
Stillwater Mine
Platinum Team . . . . . Nye, Montana

2002 NATIONAL MINE RESCUE BENCHMAN'S CONTEST CHAMPIONS

BioPak CONTEST

DAN LUKE
Newmont Mining Corporation
Eastern Nevada Operations
Carlin Underground Mine . . . . . Carlin, Nevada

PREVIOUS NATIONAL CHAMPIONS BENCHMAN'S CONTEST

2000 **JOE BACA** (BG-4), Blue Team, Waste Isolation Pilot Project, Westinghouse Electric Corporation - Carlsbad, NM

2000 **RICHARD WEST** (BG-174A), Silver Team, Waste Isolation Pilot Project, Westinghouse Electric Corporation - Carlsbad, NM

2000 **ROD CLEMENT** (BioPak 240), No. 4 Mine & Mill, Zinc Corporation of America, Hailesboro, NY

PREVIOUS NATIONAL CHAMPIONS *(cont'd)*

BENCHMAN'S CONTEST

1998 **JOE BACA**, Waste Isolation Pilot Project, Westinghouse Electric Corporation - Carlsbad, NM

1996 **MACLANE BARTON**, West Fork Mine, Missouri Lead Division, ASARCO, Inc. - Bunker, MO

1994 **FRED MILLER**, Waste Isolation Pilot Project, Westinghouse Electric Corporation - Carlsbad, NM

1992 **LESLIE WAREHAM**, General Chemical Mine, General Chemical Partners - Green River, WY

1990 **STAN AMRINE**, Parachute Creek Mine, Unocal Mining Division - Parachute, CO

1988 **KARL SAUER**, Homestake Mine, Homestake Mining Co. - Lead, SD

1986 **ART DAVIS**, Henderson Mine, Amax, Inc. - Empire, CO

1984 **STEVE YANCHUNIS**, Schwarzwalder Mine, Cotter Corp. - Golden, CO

1982 **ART DAVIS**, Henderson Mine, Amax, Inc. - Empire, CO

1980 **ALAN HERMEZ** (Draeger), Carr Fork Mine, Anaconda Copper Co. - Tooele, UT

1980 **RODNEY PHILBRICK** (McCaa), Pine Creek Mine, Union Carbide - Bishop, CA

1978 **WILLIE DAVIS** (McCaa), Lisbon Mine, Rio Algom Corp. - Moab, UT

1978 **KEN JOHNSON** (Draeger), Climax Mine, Climax Molybdenum Co. - Climax, CO

1976 **STEVE MURRAY**, Bunker Hill Mine, Bunker Hill Co. - Kellogg, ID

2002 NATIONAL MINE RESCUE FIRST AID CONTEST CHAMPIONS

CARMEUSE LIME, INC.
Maysville Mine
Maysville Operations
Raiders. . . . . Maysville, Kentucky
Gary Lewis (Team Leader)
Ken Heater
Mark Bickley

2002 NATIONAL MINE RESCUE MULTI-GAS INSTRUMENT CONTEST CHAMPION

CARGILL, INC.
Cayuga Mine
Cayuga Lakers. . . . . Lansing, New York
John Gibson

2002 NATIONAL MINE RESCUE
"OVERALL" (COMBO) CONTEST WINNERS

Westinghouse Tru-Solutions
Waste Isolation Pilot Plant (WIPP)
WIPP Silver . . . . . Carlsbad, New Mexico
Robert Rhoades (Captain)
Richard West (Benchman)
Edgar Keyser (Gas)
Mike Proctor
David Ripley
Buddy Webb
Jamey Smith
Deena Cantrell
Mike Proctor (First Aid)
Jamey Smith (First Aid)
Deena Cantrell (First Aid)
Buddy Webb (Team Trainer)
Buddy Webb, Emergency Response Coordinator
(Official in charge)

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GENERAL RULES

FOR CONDUCTING THE CONTEST

1. The contest will be comprised of four individual events, including a Mine Rescue Team competition (two-day preliminary and one day final), an apparatus benchman contest, a multi-gas instrument contest, and a first aid contest. Each event will include a written examination.
2. Contest officials will be comprised of the Chief Judge, Contest Director, Contest Coordinator, Appeals Committee, field judges, written exam judges, first aid contest judges, apparatus bench judges, multi-gas instrument judges, mine managers, mine attendants, and isolation officials.
3. There will be no limitations as to the number of teams admitted from any county, state, district, company, or organization. There will be a $500.00 entry fee for each team entered.
4. All members of teams must be bona fide employees of the metal and nonmetal mining industry and meet the requirements set forth in 30 CFR Part 49.
5. Mine rescue teams may register up to eight team members. No more than six members may participate in the field competition. For the purpose of first aid, bench, and gas competition, a team member may not participate in more than one event and each team will only be permitted to compete in each event once. Once registered, no changes will be permitted without the permission of the Contest Director.
6. Entry forms may be obtained by a written request to:

Metal and Nonmetal Mine Safety
and Health Administration
1100 Wilson Boulevard
Arlington, Virginia 22209
Telephone Number (202) 693-9614

Entries should then be submitted to the above address at least sixty (60) days prior to the date of the contest. The entry forms will require information regarding the type of equipment (breathing apparatus) each team will be wearing and the type and model of all gas testing equipment the team will use during the field competition. Any needed equipment changes require submission of a modified list to the Contest Director for consideration of approval. (Note: Each judge will be given a list of your equipment prior to working of the problem to assist them in determining if the equipment was utilized properly and was functional.) Registration information and entry forms will be available on MSHA's homepage under the "Mine Rescue" heading at www.msha.gov. Completed entry forms can be submitted via e-mail to radomsky.john@dol.gov.

7. The team drawings for the first two days' preliminary field competitions will be conducted at the time of team registration. A separate drawing (by team captains) will be held in isolation to determine running order for the final competition on the third day. Position changes necessary for management of the contest will be permitted if the Contest Director approves the change.
8. Separate drawings for team positions will be conducted on each day of the first aid, apparatus bench, and gas instrument competitions in the respective isolation areas.
9. The day before the contest begins, team registration will be conducted between 1:00 p.m. and 6:00 p.m. at a designated location. Programs, souvenirs, and banquet tickets will be distributed to the teams.
10. On the days of the competition, all teams shall be in isolation by 7:00 a.m. No communication device capable of receiving or sending messages will be permitted in isolation.

11. The Contest Director will establish a reasonable amount of time for each team to complete the problem. All teams will be notified of the established time prior to beginning to work the problem. Any teams working beyond the established time period will be notified by the #1 Judge that they must leave the field. Those teams will be scored based on their discounts to that point and will be ranked below all teams that completed the problem within the established time period.
12. In the event of mine rescue field competition ties, the underground discount sheet will be the first tie breaker, the surface discount sheet will be the second tie breaker, mine maps will be the third tie breaker, the written test will be the fourth tie breaker, and time will be the fifth tie breaker. For the purpose of the competition on the final day, written test scores from the first and second days will be incorporated into the final composite score.
13. Discounts will not be added to the team's field score once the judges have signed their discount sheets. This does not preclude changes due to administrative errors or a mis-application of a rule.
14. After the scorecards are checked by the scorecard examiners, they will be taken to a designated location. The team captain, trainer, and one other team member may examine their team's scoring cards for a time not to exceed 20 minutes. No protest of the discounts assessed may be given to the person in charge of the review, however, the team captain and/or trainer may protest in writing any discount within 60 minutes after reviewing them. Written appeals are not to exceed one page for any discount assessed and will be submitted to the Appeals Committee. Documentation (contest rules and other documents used in the contest) supporting the appeal will be accepted. Any protest(s) will be considered by the Appeals Committee. A discount summary sheet will be used to list the discounts. All discounts except time will be listed and totaled. Both

the captain and the review judge will sign the discount sheet to certify they have reviewed the discounts and verified the totals. (See page 5.)

15. The Appeals Committee shall rule in matters concerning any interpretations, procedures, or any matter involving proper conduct of the Contest. Any complaints filed with the committee shall be in writing and shall set forth incidents, times, names, source of information, and the act complained against. Where a written test question or rule application was found to be wrong, all teams will receive the appropriate correction. A decision by a majority of the committee shall be binding.
16. Following the awarding of the trophies and plaques, team standings will be available to the teams. The results from all elements of the contest will be mailed to the teams at the earliest possible time.
17. All hours mentioned in the rules are based on local time.
18. Prior to the contest, contest equipment will be accepted at an address and during a time frame to be specified. The cost of all shipments must be prepaid, and all boxes, cartons, etc. should be clearly labeled “Hold for National Mine Rescue Contest.”

NATIONAL MINE RESCUE CONTEST

Team Discount Summary Sheet

Team No. _____

Company Name _____

Team Name _____

Judge #1 Surface_____

Underground_____

Judge #2 Surface_____

Underground_____

Judge #3 Surface_____

Underground_____

Written Test _____

Map _____

Working Time: Hours ____ Minutes ____ Seconds ____

Total Discounts
Excluding average time _____

I certify that I have read and reviewed all discounts listed above.

_____ _____

Team Captain Review Judge

GUIDELINES AND PROCEDURES

Team Members

Each team shall be composed of five members and one fresh air base attendant. Each member shall wear a number on the arm at or near the shoulders with number one (1) being assigned to the captain and the number six (6) to the fresh air base attendant. Switching of numbers by team members will not be permitted after arriving at portal or fresh air base. Any means of affixing legible numbers on the sleeve of the uniform will be acceptable. Additional persons, who had been isolated with the team, may assist the team placing equipment prior to starting the clock. Only the fresh air base attendant will be allowed to assist the team after the clock has started. The fresh air base attendant will be isolated from visual contact with the field while the teams are in the mine and will maintain voice communications with the team utilizing a portable, hard wire, communications system.

Teams wishing to communicate with the fresh air base attendant shall use their portable communication system, or they must return to the fresh air base.

Medical Requirements

A letter from management or physical examination forms, dated within the twelve (12) months preceding the contest showing that each member of the team is physically sound and capable of performing strenuous work under oxygen, shall be provided at the time of team registration.

Equipment

Breathing apparatus approved for at least two hours shall be used in the Mine Rescue Contest problems. Each team member must have his/her own approved breathing apparatus. Teams cannot expect recharging materials, apparatus parts, and accessories for all types of apparatus at the contest site.

Team members must wear an approved protective hat, identification tag, safety shoes, permissible cap lamps, self-rescuer, and be clean shaven to the extent that a good face-to-facepiece seal is achieved.

Each team must have approved gas instruments, or testers for rescue and recovery work.

Teams are required to bring with them a sufficient supply of materials. Brattice, boards, PVC piping, or other materials necessary for constructing bulkheads or stoppings (if necessary in problem) will be furnished by the field committee. Teams will be responsible for collecting the material from the source of supply. (Staplers will not be permitted in lieu of hammer and nails.)

When teams report to the fresh air base to begin the problem and are given information indicating that explosive gas(es) is/are or may be present in the mine, they must have non-sparking tools while they are working the problem so as not to endanger themselves. If teams do not have non-sparking tools, they must ask the official in charge at the fresh air base to provide them with such tools before they go underground.

If the mine is not classified as gassy and the teams go underground to work the problem and encounter an explosive gas and they do not have non-sparking tools, they must return to the fresh air

base immediately and ask the official in charge to provide them with such tools.

Team Preparation (Apparatus)

Team members must make necessary checks of all apparatus for proper working condition and airtightness prior to going underground. Cylinder pressures must be within specifications of approval. Apparatus tests must comply with prescribed tests for that particular type of apparatus.

An approved 2-hour, 3-hour or 4-hour oxygen breathing apparatus must be used on the survivor(s) or other rescued personnel when respiratory protection is needed. One-hour self-rescuers are not to be used for the evacuation or rescue of survivors.

Written Test

Written tests will be administered to all team members at the same time, unless authorized otherwise by the Contest Director. The questions for the written test will be taken from material contained in MSHA-approved mine rescue training modules 2202 Mine Gases, 2203 Ventilation, 2204 Exploration, 2205 Fire, Firefighting, and Explosions, 2206 Rescue of Survivors and Recovery of Bodies, and 2207 Mine Recovery.

MSHA training modules are available at the following address:

U.S. Department of Labor
National Mine Health and Safety Academy
ATTENTION: Printing and Training Materials Distribution
1301 Airport Road
Beaver, WV 25813-9426

Telephone: (304) 256-3257
Fax: (304) 256-3368
E-mail: DistributionCenter@dol.gov

The written test of thirty-five (35) questions will include at least ten (10) questions on mine gases from Module 2202 for each team member. The questions shall consist of true/false and multiple choice questions.

All tests will be scored by two qualified judges using a Scantron test correcting machine. The contestants will be assessed one discount point for each incorrect or unanswered question. Any alterations to the test questions or answers will be determined to be incorrect by the test judge and discounts assessed.

In special circumstances, individual team members may be given oral instead of written tests by one or more judges. Requests for consideration shall be presented to the Contest Director at the time of registration. All other team members will take the test at the same time. In any case, the judges will not explain the meaning of questions, but may explain a word or words in the questions.

Judges

The Chief Judge and his/her assistants will be persons trained in the assembly, use, and care of the different types of breathing apparatus, etc., and will not be connected with any of the teams, teams' employers, or companies who manufacture apparatus or gas detecting devices. Exceptions to personnel assigned for judging any phase of the contest requires the approval of the Contest Director.

Competing teams deserve the full attention of the judges and only those personnel judging the specific

teams are allowed on the field. While the team is in the mine, judges must not ask questions, answer questions, or interfere with the team. Only personnel approved by the Contest Director will be permitted on the field. Media access and videos for future training aids will be allowed with the Contest Director's approval.

Only persons trained in the assembly, use, and care of the different types of mine rescue equipment and trained in mine rescue procedures will be used as judges.

A minimum of two (2) persons will judge the gas instrument test, apparatus bench test, first aid test, and written test. A minimum of three (3) persons shall judge the team during the entire working of the field problem.

During preparation, judges are to observe the captain and other team members as to their knowledge and proper operation of the self-contained breathing apparatus, gas detecting devices, other respiratory protection equipment to be used, and firefighting equipment, etc.

The mine manager will be stationed, and must remain, at the fresh air base when the teams are working the problem.

As each team performs a problem, it will be rated by a crew of three or more designated judges. Only the Contest Director, Chief Judge, or their designee may discuss discrepancies or discounts on the field. When discussions are held on the field that interrupt the working of the problem, the time should be stopped and restarted after the discussion is over. A Mine Safety and Health Administration employee will be the #1 Judge. All judges must have current Mine

Rescue Judge's Training and have been briefed on the particular problem and possible solutions.

The judges will mark and explain on their scorecards the discounts for work performed by each team member. In the event that more than one discount applies, the highest discount will be assessed for a violation. There will be no stacking of discounts. Judges must sign their scorecard after the discounts have been recorded. Scorecards will be marked promptly and delivered to scorecard examiners as soon as possible after completion of the problem.

Security

Each team must be under guard before the start of the contest, in a location assigned by the Chief Judge, and must remain continuously under guard until time to work the problem. Any team receiving information concerning a contest problem will be disqualified. No person except guards, and contest officials authorized to do so, will be allowed to communicate with any team or teams under guard. Teams that have performed will not be permitted to communicate with any teams awaiting their turn to perform.

Contest Problem

The problem will be limited to working on one level. It may include hoists or shafts. Skip pockets and sumps (either above or below) will be considered part of the working level. Raises or boreholes may be in the problem; however, climbing will not be required.

Teams may have to change existing ventilation, pump water, or move falls to rescue persons and/or explore if it can be done safely. Changing ventilation

shall not be done until the official in charge has been informed. Ventilation changes will be considered as starting, stopping, altering, or redirecting the air current. If existing check curtains are to be used to direct ventilation, the check curtain must first be converted into a temporary stopping. Regulating airflow to control a fire is not considered a ventilation change.

All areas that have been cleared of smoke and toxic or dangerous gases that the teams elect to travel through must be rechecked prior to the team's reentering. Upon re-entry into these areas where the ventilation has been changed, teams shall make gas tests at all openings along the route they travel.

When smoke or gas is encountered in an opening, it will be considered to extend to a placard indicating the smoke or gas is cleared, or to a separation intended, or indicated to be air tight.

If water is being pumped, ventilation changed, falls moved, loose rock barred down, etc.; teams must wait until placards have been changed by the ground committee before assuming they have accomplished what they were trying to do.

Inaccessible areas only need to be explored when there are miners unaccounted for or if an explosive air/gas mixture will be moved through the unexplored areas. Teams may be required to pump water or set timbers to explore inaccessible areas. If this is necessary, appropriate materials will be provided in the problem.

Only judges, contest officials, escorted photographers, and news media approved by the Contest Director or Chief Judge will be permitted in the working areas.

Insofar as possible, materials rather than placards will be used in the mine. Bodies with identification

will be designated by the use of dummies. When placards indicating conditions are used, they will be placed face up, and the letters shall not be less than one (1) inch in height, and easily visible.

Additionally, when these placards are used to identify mining machinery or equipment, a description of the current condition of the equipment and/or a photocopy of a picture of such machinery or equipment shall be on the placard, when possible, to aid teams in identifying it.

Terms used in the problem shall be terms which appear in the Rule Book Glossary, the MSHA Mine Rescue Training Modules, or CFR 30, Part 57.

When raises, winzes or boreholes are in the problem, the card identifying them will indicate whether they go up and/or down from the level.

TEAM PREPARATION AND PROCEDURES

Apparatus and Material Checks

Before reporting to the contest field, each team member must check his/her own apparatus to see if it is charged properly and in good working condition. These checks must be within the manufacturer's specified limits and the regenerator fully charged with chemicals. Apparatus tightness, valves, warning devices, and face pieces are to be checked according to approved methods for the particular apparatus. The extra breathing apparatus must also be tested accordingly.

Other materials such as roof testing devices, stretchers, hammers, blankets, fire extinguishers, and gas detectors must be checked to see that they are in good operating condition. If horns are to be used for signaling between team members, they should be

checked. A portable communication system, utilizing insulated wire strong enough to give and receive manual signals, must be used by all teams. Wheeled stretchers will be allowed.

Briefing

When all members of the team have their apparatus fully assembled and ready to wear, the captain should assemble the team and report to the Briefing Station Official when directed by the guard. The team will be given copies of the mine map and briefed on field conditions either by a video or a briefing paper. The briefing should contain all pertinent information, including the following conditions: classification of the mine; frequency of explosive gas being found; accuracy of the mine map; possibility of the mine being cut into another mine; condition of the fan; have guards been posted; electric power cut off from the mine or affected parts of the mine; recovery work that has been accomplished; notification of the local, state, and federal agencies; reserve rescue teams, equipment, and materials that are available.

Any final adjustments to the equipment and necessary talks between team members can be completed prior to reporting to the field judge.

Reporting to Field

On reporting to the field, the captain should have the team line up at the place indicated by the person in charge. The captain introduces his team and remarks “We are here to offer our help. I have a fully equipped, properly trained, and physically fit mine rescue team and we are ready to do anything that you may require in the rescue and recovery work at your

mine." The official in charge will reply that they do require the service of mine rescue teams, and that if they are ready, they can be of immediate service.

Start of Problem

When the necessary introductions have been made, the team captain will indicate that they are ready. No work will be done until the clock is started. The captain will start the timing device and date the board (month, day, year, and team position number). After the clock is started, only the five working team members and the fresh air base attendant will be permitted to do the work at the fresh air base. MSHA's field attendants will feed out and reel in communication wire once the team leaves the fresh air base.

On the map, solid lines will denote actual workings. Although locations may not be totally accurate within the six (6) foot map requirement, solid lines will represent known conditions. Dotted lines will denote projections and may or may not be accurate. These conditions should be studied carefully so that proper procedures may be decided in advance.

Equipment Checks and Procedures

No testing of equipment is required at the fresh air base. Testing of equipment used by the team will be performed while the team is in isolation before reporting to the field. This testing will not be judged, however, if any defects occur while working the problem, discounts will be assessed. Random checks of equipment to insure reliability may be made upon completion of the problem.

Standard Communications and Signals

A portable communication system, utilizing hard wire, will be used to inform the fresh air base of all conditions encountered. In the event of a communication failure, the team will be required to return to the fresh air base to repair or replace the system.

The following standard horn blasts or other audible signals between team members will be used:

1 blast on the horn will mean for the team to "stop" if in motion
2 blasts on the horn will mean "advance"
3 blasts on the horn will mean "retreat"
4 blasts on the horn will mean "distress"

State hoist shaft signals will be used wherever contest is held.

NEVADA HOIST SIGNAL CODES

The conveyance shall not be moved without a command signal. When persons are to be hoisted or lowered, they must enter the conveyance and close the door; then give the signal for the desired level followed by either "Hoist Persons" (3-1 bells) or "Lower Persons" (3-2 bells).

3-2-1 Bells:	Blasting Signal - hoisting engineer must acknowledge by raising and lowering conveyance slightly.
9 Bells:	Emergency - then ring mine level signal where emergency exists.

MINE LEVEL SIGNALS

Surface Shaft Collar - 1-2 Bells
500 Feet First Level - 2-1 Bells

HOIST SIGNAL

1 Bell	-	STOP
2 Bells	-	Lower Conveyance
3 Bells	-	Raise Conveyance
3-1 Bells	-	Hoist Persons
3-2 Bells	-	Lower Persons
3-3-1 Bells	-	Hoist Slowly with Caution
3-3-2 Bells	-	Lower Slowly with Caution
1-2-1 Bells	-	Hoist Muck or Materials Only
2-1-2 Bells	-	Release Conveyance

Team Safety

Team members must follow established procedures, per the MSHA National Contest Rules Book for the type of equipment used, when getting under oxygen.

The team captain must now check each member's apparatus. A team member must make the same checks on the captain's apparatus. The judges will observe the operation and adjustment of the apparatus.

The captain should see that the team line is properly stretched out and that the team members are holding or are attached to the team line.

If a team encounters smoke, an apparatus check or personnel check is required before entering smoke. In smoke, all team members must have hold of, or be fastened to, a lifeline.

The captain must now have the team count off either orally or visually by the raising of hands.

The captain must give the signal to advance. The stretcher bearers should pick up the stretchers, and the rear captain shall relay the signal to the fresh air base. When the signal is returned, the team may now advance into the mine.

Teams shall never travel through water over knee deep. Entrances to all mine openings shall be examined. This examination should not cover more than twenty-five (25) feet. In air clear of smoke, these checks may be made without a lifeline, provided the entire team does not go into the entrance.

Checking for loose ground (loose roof or rib) is done visually by the team captain as the team advances. The captain must verbally indicate that he is checking for loose ground at every location required. The team captain must orally warn the team each time loose ground conditions are encountered. A similar warning must be given by the rear captain upon retreat.

First Team Stop

After advancing into the mine not more than fifty (50) feet from the cage or portal, the captain shall give a signal for the team to stop. The co-captain may take no more than two steps forward after the horn blast before stopping. The captain now checks the members and their apparatus to see if they are in good condition and a team member checks the captain and his/her apparatus. (This check must not be made on the cage.) The procedure shall be followed at not more than twenty (20) minute intervals while the team is working the problem. Additionally, apparatus re-

moved in order to enter a confined area or apparatus that has sustained possible damage from impact must be checked before continuing.

If all the apparatus are operating properly and the members are in good condition, the team can now continue into the mine.

The cage door must be closed and the signal to release conveyance to a standby mode must be sent after the cage has been unloaded.

Advancing

When stops are made at the openings of crosscuts, intersections, or drifts turned off the drift that is being traveled, separate gas tests must be made across each entry within 25 feet of each opening to the place turned off the entry. No place, which intersects entry direction, should be passed without first checking the condition of that place. Examination of any intersection or entry shall not exceed 25 feet from the rear captain. This means the captain can extend out into openings and take gas readings within the limits of the team line.

In case of entries turned from the entry being traveled, it is a matter of choice which entry is to be followed and many things must be taken into consideration in making the choice. However, the openings of all places must be checked before that place is passed. A team will be considered to have passed an opening or intersection when the number 5 member is past the opening.

While advancing, if a team encounters an impassable fall or other condition that prevents the members from following the normal course of travel into an area, they may break a stopping and enter that area. If

it becomes necessary to break a stopping, the team shall erect a temporary stopping or stoppings that would have the same effect on the area that the original stopping would have provided. Doors shall not be opened without prior knowledge of the effects of the mine ventilation system, unless a temporary stopping has been erected. Regulators shall not be opened without prior knowledge of the effects of the mine ventilation system, unless a temporary regulator has been erected.

Where crosscuts are blocked, no team member may advance more than three (3) feet beyond the second (2^{nd}) intersection before tying across and/or behind into all unexplored areas that intersect. The second intersection will be determined by two crosscuts on either side of the entry being traveled. The first intersection will be the blocked intersection. However, a team will be permitted to tie across to adjacent drifts to tie in behind.

Barricades

If a barricade is found, the team will take action to protect the barricaded persons as indicated by the conditions found outside the barricade. Before the barricade is opened, the entire area of the mine is assumed to be filled with an irrespirable atmosphere unless otherwise specified in the problem, and will require the construction of a reasonably airtight temporary stopping. The space between the barricade and the temporary stopping should be as little as feasible; however, it should be large enough for the team to enter. When entering the barricaded area, the opening in the barricade should be kept to a minimum, the roof in the area shall be tested, and gas tests made. For the

purposes of contest work, no barricade will be entered without ventilating in front of the barricade if: Oxygen (O_2) is below 17.0%; or Carbon Monoxide (CO) exceeds 1200 PPM (0.12%); or Hydrogen Sulfide (H_2S) exceeds 100 PPM (0.01%); or Nitrogen Dioxide (NO_2) exceeds 20 PPM (0.002%); or Sulfur Dioxide (SO_2) exceeds 100 PPM (0.01%); or Carbon Dioxide (CO_2) exceeds 4.0%. In the event that gases other than these are encountered or indicated by the problem, the team must ask for stain tubes or testing devices for these gases if they don't have them.

If survivors are found, they shall be given proper respiratory protection. If more than one (1) survivor is behind the barricade and proper protection cannot be provided for all of them, the team in retreating should keep the openings in the barricade and temporary stopping to a minimum so that as little irrespirable air will get into the barricaded area as possible. If the area beyond the last survivor can be explored without advancing the survivor, this should be done before retreating with the survivor. When all the survivors have been removed from the barricaded area, the enclosure may be opened as wide as necessary for easy exit. Survivors must be secured to the stretcher and covered with a blanket unless first aid procedures indicate other treatment is proper. If a person is found behind a barricade or in a refuge chamber and the area is not entered, the team may advance beyond the chamber for exploration. However, if survivor(s) can be safely evacuated without changing conditions, they shall be evacuated before any further exploration is done.

Dates and Initials

The date and the captain's initials must be marked at the point of farthest advance of the team in any direction such as at stoppings, faces of rooms and drifts, water over knee deep, impassable falls, barricades, fires out of control, and at the location of any survivors or bodies. The captain must verbally indicate to the judges each time he simulates marking his initials and date.

Map - Timing Device

When the team has explored all accessible areas, accounted for all miners and completed all required work, they should return to the fresh air base and count off. After the team checks the maps, the captain should present both maps to the persons in charge of the mine and stop the timing device. The map person must use the standardized map legend provided in this MSHA Rules Book (see pages 106-110) or write everything out. Teams will be expected to accurately map all required items on the maps maintained by the team and the fresh air base attendant.

The marked maps must show: the condition of all faces, stoppings and doors; the location of all placards or materials; the location of fires and barricades; and the location of dead bodies and survivors (including identification). Temporary stoppings that are erected shall also be shown as well as the location of any gas found or indicated by placards. The maps must show all locations dated and initialed by the team captain. If a team fails to explore the entire mine, the furthest point of advance shall be indicated on the maps by a line drawn across the entry with the appropriate mine map legend symbol.

Mine Fires

When a mine rescue team encounters a noncombatible fire, indicated by "intense heat" or "fire out of control," the team shall, without undue delay, seal the fire or regulate the fire, so as to restrict the air flow to the fire and prevent its further advance. Regulating airflow to control a fire is not considered a ventilation change. The team must then, without undue delay, find all other approaches to the fire and seal or regulate them. This does not preclude systematic exploration of the area. Whether to use regulators to control the fire or to entirely seal the fire must be decided by the team. The team must inform the official in charge prior to making any ventilation changes. This decision will take into consideration the safety of the team and any survivor(s), the classification of the mine (gassy/nongassy), the presence of any explosive gases, the possible effects of any ventilation change(s), and other pertinent data. A regulated fire, left unsealed, has the potential to emit contaminants into the mine atmosphere.

MINE RESCUE DISCOUNTS AND INTERPRETATIONS

Surface Discount Sheet

Judge #1

Time: Hours ____ Minutes ____ Seconds ____ **Discounts**

1. Apparatus improperly assembled, each apparatus — 10 x ___ = ____
2. Apparatus improperly adjusted to the wearer, each infraction — 1 x ___ = ____
3. Failure to follow prescribed procedures for going under oxygen, each person — 3 x ___ = ____
4. Apparatus part or parts worn or deteriorated so as to be dangerous to wearer, each person — 8 x ___ = ____
5. Failure of captain to examine each apparatus and have captain's examined before entering the mine, each apparatus each infraction — 2 x ___ = ____
6. A team member failing to carry identification upon his/her person, each member — 2 x ___ = ____
7. Team member not wearing protective clothing, including safety shoes, hard hat, permissible cap lamp, self-rescuer, each infraction — 2 x ___ = ____
8. Failure of team captain to mark date and team position number on the check board at mine portal or fresh air base, or start timing device, each omission — 4 x ___ = ____
9. Failure to be clean shaven in areas that affect a good face-to-facepiece seal, each infraction — 10 x ___ = ____
10. No work will be done prior to starting the clock — 4 (total) ____

_____ **Total Discounts** _____

Judge's Signature

MINE RESCUE DISCOUNTS AND INTERPRETATIONS

Surface Interpretation

Judge #1

1. Apparatus not meeting manufacturer's life critical specifications during use. This discount will be applied if the team captain or team member does not correct it before the team goes underground.
2. Shoulder straps, chest straps, etc., that are twisted or not fastened. (Separate discount for each strap.) This discount will be applied if the team captain or team member does not correct it when the team goes under oxygen.
3. This will depend on type of apparatus used; the proper procedure will be outlined in the apparatus section. Once the team has entered the course, no further penalties can be assessed by the judges for items 1, 2, 3.
4. Holes in the breathing tubes or straps worn to the extent that they break during working of the problem while still at the fresh air base, should not be discounted if they are replaced prior to starting work in the mine.
5. The captain must examine the apparatus of team members and have a team member examine the captain's apparatus before entering the mine. The person making the check must obtain assurance from person being checked that he/she is all right (asking if person is okay will suffice).
6. Metal tag on member's belt with name and employee identification number in addition to the team member's number on arm at or near the shoulder. Number on hat or cap lamp is not acceptable.
7. All equipment must be permissible and operating before advancing into the mine. In the event of an equipment failure other than a SCBA, the team will fix it,

use the back-up, or return to the FAB to replace the failed equipment.

8. Captain must mark date and team position number on check board after clock is started, and the captain must stop the clock after the map is turned in.
9. Self-explanatory
10. Self-explanatory

MINE RESCUE DISCOUNTS AND INTERPRETATIONS

Underground Discount Sheet

Judge #1	Discounts
1. Breathing external air while working problem, each team member, each infraction	10 x ___ = ____
2. Team not following proper procedure in case of apparatus failure, each infraction	10 x ___ = ____
3. Failure to use posted hoisting signals, each infraction	1 x ___ = ____
4. Failure to close shaft station gate	5 x ___ = ____
5. a. Failure of the captain to indicate to the team he/she has recognized bad ground. b. Failure of the captain to verbally indicate he/she is checking the back or roof; 1. at intersections, shaft stations, rooms, faces, and mine openings; 2. at all points of farthest advance; 3. before building or erecting any structure; 4. upon passing through any barricade, stopping, bulkhead, air lock; door; check curtain, or similar barrier; 5. at the location of fire or intense heat. c. Any team member performing work or moving into any part of an area during a team stop before the captain has visually checked the ground conditions in that part, each infraction	5 x ___ = ____

6. Failure of the captain to mark the date and his/her initials at the point of farthest advance of the team in any direction such as at stoppings, faces of rooms and drifts, water over knee deep, impassable falls, barricades, fires out of control, and at the location of any live persons or bodies, each omission (maximum 10 discounts)	2 x ___ = ____ (10 max.)
.7 Failure of team to stop within 50 feet of the fresh air base or at the shaft station to perform personnel and apparatus checks, upon their first entry into the mine	4 (total) ____
8. Team member(s) not making apparatus check after removing apparatus to traverse restricted clearance or after apparatus has sustained possible damage from impact (total team discounts, each incident)	4 x ___ = ____
9. Captain or other team member doing anything to endanger himself/ herself or other team members, 15 points each team member so endangered, each infraction, each occurrence	15 x ___ = ____
10. Failure of team to explore or examine workings systematically and thoroughly, each omission	4 x ___ = ____
11. Teams must be checked immediately before entering smoke	5 x ___ = ____
12. Failure to locate, seal, or extinguish fire, if possible, without undue delay	8 (total) ____

13. Apparatus examination exceeding
20-minute intervals 5 x ___ = ____

_____ **Total Discounts** _____
Judge's Signature

MINE RESCUE DISCOUNTS AND INTERPRETATIONS

Underground Interpretation

Judge #1

1. Working all or part of problem without a facepiece or working with inhalation hose disconnected.
2. Proper procedure would depend on type of apparatus; however, team must proceed to fresh air base immediately.
3. Hoist shaft signals will be posted at shaft stations and will be used to notify the hoistman of intended movement and cage release.
4. Self-explanatory.
5. a. Must so indicate before any other team member passes the placard. This applies each time such a placard is reached; when retreating the rear captain must do this.
   b. 1. Must be so indicated before physically entering the area.
      2. Includes checking in front of any physical barrier to advancement.
      3. Including erecting or breaching stoppings, barricades, curtains, etc.
      4. Must be so indicated before physically passing through.
      5. Must be so indicated immediately upon reaching the placard indicating fire or intense heat.
   c. This means the captain's physical presence is necessary before any part of an area can be considered as having been examined.
6. Such places only need be marked once and also must be indicated on both maps. Date means month, day, and year.
7. This check must be made:
   a. at the first stop, with all team members past the portal, or off the cage (this does not apply to checking mine entrances prior to working the problem);
   b. before the captain exceeds 50 feet from portal or shaft, and before the team leaves the shaft station.

8. This apparatus check must be made as soon as all team members have passed through the restricted area and before any other work is done. Additionally, this apparatus check must be made immediately after any apparatus has sustained a blow which might cause damage to it.
9. Examples of endangerment include, but are not limited to:
    a. 15 points will be assessed for each team member who:
        1. travels under bad roof or ground;
        2. travels into water over knee deep;
        3. travels over or under an open ore pass or ore pocket into which they could fall or be injured by falling objects;
        4. advances past a sign indicating intense heat or fire out of control.
    b. entire team will be considered endangered and 75 points assessed for:
        1. failure to check a shaft for possible damage, or the presence of fire or flooding, prior to traveling through it. For contest purposes, this check may be done by placing combustible materials on the cage and having the cage lowered to the level to be explored, then raising it to the collar;
        2. not having non-sparking tools in a gassy mine or when explosive gases are found in a non-gassy mine;
        3. changing conditions of the mine ventilation system in such a manner that an explosive mixture is moved over an ignition source. Changing conditions of the mine ventilation system in such a manner that an explosive mixture is moved over an unexplored area. If a team explores all sides of an overcast or undercast, both ends of a ventilation shaft, or the top and bottom of shafts when the shaft cannot be traveled, the in-between areas are considered explored for ventilation purposes;
        4. continuing exploration after conditions are found to indicate an imminent explosion is possible by the presence of an explosive mixture and the evi-

dence of fire (smoke or carbon monoxide) and the location of the fire is unknown. A team must continue to explore if it knows there is a continuous nonexplosive separation between the explosive mixture and the evidence of fire. Utilizing electric or battery-powered equipment in explosive air/gas atmosphere. Ignition sources would include any communication device, unless designated as sound-powered or intrinsically safe;

5. Utilizing electric or battery-powered equipment in explosive air/gas atmosphere. Ignition sources would include any communication device, unless designated as sound-powered or intrinsically safe.

10. This will be assessed for not exploring all areas of the mine that can be explored without endangering team, if problem requires entire mine to be explored, or leaving accessible areas that can be safely explored without removing permanent stoppings. All accessible areas must be tied across and behind before advancing. Where crosscuts are blocked, no team member may advance more than 3 feet beyond the second intersection before tying across and/or behind into all unexplored areas that intersect. This may require building an air lock or returning to the fresh air base and exploring into other drifts at the discretion of the team and according to conditions of the mine. Shafts must be checked for possible damage, water, or fire, and must be traveled to be considered explored. All shafts must be traveled, if possible, before proceeding beyond the 2nd intersection.
11. Personnel checks, not necessarily an apparatus check. The person making the check must obtain assurance from person being checked that he/she is all right (asking if person is all right will suffice).
12. Sealing or fighting a fire does not relieve the team of the responsibility of systematic exploration
13. Self-explanatory.

MINE RESCUE DISCOUNTS AND INTERPRETATIONS

Surface Discount Sheet

Judge #2	**Discounts**
1. Failure to take necessary equipment and gas detecting devices to work the problem, each omission	4 x ___ = ____
2. Gas detectors, testers, and/or indicators failing to function properly and not corrected before entering the mine, each infraction	4 x ___ = ____
3. Testers or detectors improperly assembled or defective parts used	8 (total) ____

_____ **Total Discounts** _____

Judge's Signature

MINE RESCUE DISCOUNTS AND INTERPRETATIONS

Surface Interpretation

Judge #2

1. Failure to take necessary equipment or testing devices underground, discount should be assessed even if teams return to fresh air base to pick up necessary equipment.
2. Faulty or inadequate equipment must be repaired or replaced. (This includes instruments used beyond their designed limits or range.)
3. If any questions exist, the equipment should be checked by the judges after the completion of the problem in the presence of the team captain.

MINE RESCUE DISCOUNTS AND INTERPRETATIONS

Underground Discount Sheet

Judge #2	Discounts
1. Failure to make necessary gas tests where required, each gas, each omission	1 x ___ = ____
2. Improper procedure when testing with gas detectors, each gas, each infraction	1 x ___ = ____
3. Intentional causing of a test instrument to inflate faster than tests indicate that it should, each infraction	1 x ___ = ____
4. Traveling at more than a normal walking speed	8 (total) ____
5. Team member talking to an unauthorized person without permission of the judges or supervisors, each infraction	5 x ___ = ____
6. Failure to erect temporary barricade, stopping or regulator when necessary, each infraction	10 x ___ = ____
7. Failure to erect temporary barricade, seal, or stopping reasonably airtight, each infraction	2 x ___ = ____
8. Less than 5 members entering, working or completing problem, each person	8 x ___ = ____
9. Any team passing a card indicating a condition in the mine before determining the information on the card, each infraction	2 x ___ = ____
10. Failure to make necessary ventilation changes or changing ventilation or electric power before the effects of such changes are known, each infraction	15 x ___ = ____

_____ **Total Discounts** _____

Judge's Signature

MINE RESCUE DISCOUNTS AND INTERPRETATIONS

Underground Interpretation

Judge #2

1. Tests for gases must be made at face areas and stoppings. When stops are made at the openings of crosscuts, intersections, or drifts turned off the drift that is being traveled, separate gas tests must be made across each entry within 25 feet of the rear captain's position. No place shall be passed without first checking the condition of that place. That is, if a room is turned from the entry, that room shall be checked before examining the entry beyond the opening. This does not necessarily hold true in cases of entries. In cases of entries turned from the entry being traveled, it is a matter of choice which entry is to be followed and many things must be taken into consideration in making the choice. However, all places must be checked before that place is passed. A team will be considered to have passed an opening or intersection when the No. 5 member is past the opening. All areas that have been cleared of smoke and toxic or dangerous gases that the teams elect to travel through must be rechecked prior to the team's reentering. Upon re-entry into these areas where the ventilation has been changed, teams shall make gas tests at all openings along the route they travel.
2. This will depend on type of instrument used. Improper procedure when testing includes the location of the instrument when testing or using a gas detection device beyond its limits or range. For example, a methane detector must be held overhead when testing because methane (CH_4) is light and will be found in high places near the back or roof. Nitrogen dioxide (NO_2) is relatively heavy and will be found in greater concentrations along the floor and in low places. Therefore, this test must be made with the tester below the waist. Carbon monoxide (CO) is slightly lighter than air so this test must be made at chest height.
3. Self-explanatory.

4. Teams traveling obviously faster than a normal walk (a majority of judges must concur on this) shall be discounted.
5. Do not hesitate to assess this discount; however, explain and name unauthorized person on discount card and state instructions given, if known.
6. Stoppings, doors, regulators, and barricades require construction of temporary stoppings by a team before a team may make openings in the pre-existing stoppings, doors, etc. Doors shall not be opened without prior knowledge of the effects of the mine ventilation system, unless a temporary stopping has been erected. Regulators shall not be opened without prior knowledge of the effects of the mine ventilation system, unless a temporary regulator has been erected. This does not apply to existing check or drop curtains used to direct the air current. When retreating out of a barricade or coming back through a stopping where an air lock has been erected, it will not be necessary to air lock on the way out, if this will not change any existing ventilation.
7. Temporary barricade, seal, or stopping must be fastened at top, sides, and bottom. Simulating fastening a barricade is not acceptable. Air curtains that have to be upgraded to temporary stoppings, such as a curtain that directs airflow, require additional material such as a 2-by-4 on the bottom of the curtain and nailed to make a good seal.
8. This does not apply to checking mine entrances prior to working the problem.
9. Means if all five team members pass the card.
10. Teams must inform the official in charge before changing the ventilation or electric power, and such things as explosive gases and the safety of trapped miners and rescue personnel must be considered. Teams do not have to exit the mine to change power or ventilation. Teams can inform the fresh air base attendant by approved communication devices available, and the fresh

air base attendant must inform the official in charge before changing ventilation or electric power. Informing the official in charge of the fresh air base does not relieve the team of the responsibility of their decision.

MINE RESCUE DISCOUNTS AND INTERPRETATIONS

Surface Discount Sheet

Judge #3	Discounts
1. Failure to connect phone when applicable before entering the mine	2 (total) ____
2. Failure to take wire communication system into the mine	10 (total) ____
3. Failure of team to "count off" before entering or leaving the mine	2 x ___ = ____
4. Failure to secure extra apparatus to stretcher, each omission	4 x ___ = ____

_____ **Total Discounts** _____
Judge's Signature

MINE RESCUE DISCOUNTS AND INTERPRETATIONS

Surface Interpretation

Judge #3

1. Self-explanatory.
2. Rescue teams are required to utilize a portable mine rescue communication system approved under 30 CFR Part 23 or a sound powered communication system. The wire for this system shall be strong enough to be used as a manual communication system. This would apply only if all team members were in the mine.
3. This can be done at any time after the clock is started, but must be done prior to team entering the mine. It does not have to be done prior to checking portals. Hand or audible counting off is acceptable. It is not necessary to count off upon reentry or leaving mine; however, the team is also required to count off when completing problem.
4. Extra apparatus must be secured to stretcher to prevent it from falling off.

MINE RESCUE DISCOUNTS AND INTERPRETATIONS

Underground Discount Sheet

Judge #3	Discounts
1. Failure to properly secure survivor to stretcher; failure to cover survivor with blanket (unless first aid procedures indicate otherwise); or placing survivor on stretcher in such a way as to foul proper operation of apparatus, each omission	4 x ___ = ____
2. Survivor care:	
a. Failure to adequately examine and assess each person found in the mine for possible injury or illness, each infraction	4 x ___ = ____
b. Failure to properly treat any injury or illness which is, or should have been, revealed by the examination, each infraction	4 x ___ = ____
3. In smoke, any team member not having hold of lifeline, or not having it firmly attached to his/her person, each infraction	2 x ___ = ____
4. In clear air, none of the team members having hold of lifeline, each infraction	2 x ___ = ____
5. Intentionally detaching/severing lifeline	5 (total) ____
6. Failure to bring live person to surface or fresh air base by the end of the problem, each omission	10 x ___ = ____
7. Failure to locate bodies, each omission	10 x ___ = ____
8. Failure to find live persons, each omission	10 x ___ = ____

9. Failure to properly protect live person or persons, each person 10 x ___ = ____
10. Failure to follow proper procedure when putting apparatus on survivor, each infraction 5 x ___ = ____
11. Assistance given by supposedly unconscious person, each infraction 5 x ___ = ____
12. Transporting survivor in unexplored territory, leaving survivor unattended, and moving survivor in any direction except toward the fresh air base, each infraction 6 x ___ = ____
13. Failure to give proper notification with communication system of team's intentions, each infraction 2 x ___ = ____
14. The team performing an act that results in the death or injury of patient(s). Examples of this would be:
    a. Entering a barricade with toxic gases outside.
    b. Directing toxic gases over survivor(s) through a change in ventilation
    c. In the case of multiple survivors, leaving the higher priority patient and taking a less injured patient out, each infraction
    d. Improperly protecting survivor(s) from toxic gases 50 x ___ = ____
15. Failure to notify the fresh air base when an air/gas mixture has reached its explosive range 10 x ___ = ____

_____ **Total Discounts** _____
Judge's Signature

MINE RESCUE DISCOUNTS AND INTERPRETATIONS

Underground Interpretation

Judge #3

1. Survivor shall be secured to stretcher by at least two bandages or straps, one around trunk of body and one around legs, covered with blanket, and placed so as not to crimp air hoses. (Hands of unconscious person must be secured.)
2. This will be based on the Brady First Responder, Sixth Edition, Chapters: 4, 5, 6, 7, 8, 9, 10, 11 and 12, MSHA Mine Rescue Training Module 2206 "Rescue of Survivors and Recovery of Bodies." (This book may be ordered from the National Mine Health and Safety Academy. See page 10.) A team must deal with a victim(s), if there is either visual or verbal contact, if the rescue can be done without violating procedures. Visual contact requires the captain's presence in the area. Verbal contact is any voice communication from the victim that can reasonably be expected to be heard by the team.
3. Applies to any smoke. All team members must be in air clear of smoke before any team member drops lifeline. Any part of a team member (hand, etc.) in smoke, team member is in smoke. This discount cannot be assessed when checking mine entrances or portals on the surface.
4. Self-explanatory.
5. Self-explanatory.
6. Self-explanatory.
7. Self-explanatory.
8. Self-explanatory.
9. Among other things, using an auxiliary self-contained breathing apparatus or self-rescuer on a live person instead of an approved 2-hour, 3-hour, or 4-hour self-contained breathing apparatus is a failure to properly protect that survivor.

10. Self-explanatory.
11. Among other things, using an auxiliary self-contained breathing apparatus or self-rescuer on a live person instead of an approved 2-hour, 3-hour, or 4-hour self-contained breathing apparatus is a failure to properly protect that survivor.
12. If a person is found behind a barricade or in a refuge chamber in a contaminated area, and the barricade or refuge chamber is not entered, the team may advance.
13. Failure to notify fresh air base by phone of team's intentions would include advancing or retreating team prior to giving signal or notifying fresh air base and receiving reply. When advancing, and captain gives signal to stop, No. 5 member may not move more than 2 steps. If team is stopped and captain gives signal to retreat or advance, the No. 5 member must await return signal prior to starting to move. The No. 5 member may move from side to side to give captain more area when team is connected by lifeline in smoke or by telephone line as long as he/she does not pull or give line. All team members must hold or be attached to the lifeline at all times while traveling. If taglines are used between team members and the team line, they shall be no longer than 3 feet in length. Do not apply this to movement at the fresh air base.
14. An act which does not endanger the team, but kills or injures the patient(s).
15. Failure to notify the fresh air base when an air/gas mixture, which reached its explosive range, has been encountered.

NATIONAL MINE RESCUE CONTEST

Written Examination Discount Summary Sheet

Company Name:_____

Team Name: _____

Draw Number: _____

	Discounts
For each incorrect answer for each person (1 discount)	
No. 1 person	1 x ___ = _____
No. 2 person	1 x ___ = _____
No. 3 person	1 x ___ = _____
No. 4 person	1 x ___ = _____
No. 5 person	1 x ___ = _____
No. 6 person (substitute)	1 x ___ = _____

_____ **Total Discounts** _____

Judge's Signature

NATIONAL MINE RESCUE CONTEST

Map Discount Summary Sheet

Company Name:_____

Team Name: _____

Draw Number: _____

1. Failure to record information on map 1 x ___ = _____

2. Not recording information accurately on map (within 6 feet of actual location measured from the center point of the object), each infraction 1 x ___ = _____

_____ **Total Discounts** _____

Map Examiner's Signature

NATIONAL MINE RESCUE CONTEST

Time Discount Summary Sheet

Company Name:_____

Team Name: _____

Draw Number: _____

Total Time

Total time will be rounded off to the next highest minute. (Total average time will also be rounded off to the next highest minute.) _____

Discounts

For each minute over average time. ½ x _____ = _____

_____ **Total Discounts** _____

Timekeeper's Signature

MULTI-GAS INSTRUMENT CONTEST

General Rules

1. One gas man will be allowed for each team entered in the Mine Rescue Contest.
2. Registration will be made with the team registration.
3. Each contestant will draw for competition order while in isolation. No switching of numbers will be allowed, unless approved by the Contest Director.
4. The Multi-Gas Instrument Contest will be held at a time and place designated by the Contest Director. All written testing will be conducted in isolation. Contestants will remain in isolation until they finish the bench competition or they will be disqualified.
5. Each contestant will be provided with a multi-gas instrument, along with spare sensors, batteries, calibration gas, tubing, regulators, calibration hoods and the tools necessary to complete the problem.

   The correct gases and all necessary tools and equipment to complete the problem will be available at the workstation. Only those tools and equipment provided will be used by contestants to work the problem.
6. Total discounts of the written, bench, and gas testing will determine the winner. In the event of a tie, the written test score will determine the winner. The total time used for the bench and gas testing will be the second tiebreaker.
7. At a pre-designated time after the written test, the test judge will conduct a five-minute review of test answers.
8. When unplanned deficiencies are encountered in the instrument, the judges will notify the contestants that the deficiency is not part of the problem. The judge will stop the clock and correct the deficiency as needed. If the deficiencies are caused by the contestant the clock will not be stopped.
9. A trophy will be awarded for first, second and third place in the Multi-Gas Instrument Contest.

Written Test

1. The written test will be given while the contestants are in isolation and will consist of twenty-five (25) multiple choice and true/false questions. The questions will be taken from:
   a. MSHA publication on Mine Gases (Module 2202)
   b. MSHA publication on Ventilation (Module 2203)
   c. MSHA National Mine Rescue Contest Rules
   d. Respective instrument manufacturer's operations manual

   Contestants will be assessed one (1) discount point for each incorrect or unanswered question. Any alterations to the test questions or answers will be determined to be incorrect by the test judge and discounts assessed.
2. Scoring of the test will be completed by at least two qualified judges.

Multi-Gas Instrument Bench Problem

1. The instrument(s) given to the contestants will have multiple bugs or problems consisting of any of the following:
   a. Missing sensors
   b. Failed sensors
   c. Mis-calibrated sensors
   d. Dead or incorrect batteries
   e. Incorrect alarm points
   f. Missing parts
2. Each contestant will be expected to evaluate the instrument, fix all of the deficiencies, properly calibrate the instrument, check for proper action level alarm set points, and then use the instrument to measure the concentrations of O_2, CH_4, CO and NO_2 in a single gas box.
3. Contestants may return to correct any uncorrected deficiencies at any time within the time limit.

4. Five (5) discount points per alarm point will be assessed for any incorrectly set alarms.
5. Five (5) discount points will be assessed for each instance of incorrect procedure or equipment use during calibration.
6. Fifteen (15) discount points will be assessed for each incorrect gas reading given during the gas box test.
7. No discounts will be assessed for replacing non-deficient sensors, as long as the resulting gas readings and alarm points are correct.
8. Each contestant shall have a maximum of thirty (30) minutes to complete the bench portion and gas-testing portion of the contest. There will be a five (5) minute warning given by the judge when time is about to expire.
9. For completion, the contestant must have the instrument fully assembled and operating and have completed all four gas readings within the allowed time.

Gas Box Testing

1. The gas testing will consist of subjecting the instrument to an unknown mixture of O_2, CH_4, CO and NO_2. The contestant will be expected to report all 4-gas concentrations within acceptable limits in the following order: O_2, CH_4, CO, NO_2.
2. Fifteen (15) discount points per gas will be deducted if a contestant does not report gas concentrations within acceptable limits:
   a. Oxygen readings are considered to be correct if within plus or minus 0.5% by volume;
   b. Methane readings are considered to be correct if within plus or minus 0.2% by volume;
   c. Carbon Monoxide readings are considered to be correct if within plus or minus 20% of the actual value present; and
   d. Nitrogen Dioxide readings are considered to be correct if within plus or minus 2 ppm of the actual value present.

Judging

1. All judges must successfully complete a training course as prescribed by the Contest Director per the instrument they are going to judge.
2. Judges must stand clear of contestants.
3. Prior to each contestant, judges shall insure that the next contestant's instrument contains only the deficiencies as per the planned problem.
4. After each contestant, judges will evaluate that contestant's instrument and confirm scoring and assess additional discounts as necessary.
5. When unplanned deficiencies are encountered, judges shall stop the clock, instruct the contestant to turn his/her back to the bench area, at which time the judge will correct the unplanned deficiencies. Judges shall instruct the contestant that upon turning back to face the bench, the clock will start. If the deficiencies are caused by the contestant the clock will not be stopped.
6. After completion of the bench problem and gas box testing, there will be a five minute review, at which time the judges will discuss discounts. After the review, both judge and contestant will sign the judge's scorecard in the spaces provided. All appeals must be in writing and submitted within one hour of the five-minute review.
7. The multi-gas instrument contest appeals committee ruling will be final.

METAL AND NONMETAL
MULTI-GAS INSTRUMENT CONTEST
Judges' Discount Card

Company Name:_____

Team Name: _____

Draw Number: _____

Contestant: _____ Instrument Model_____

Serial # _____

Time: _____ Written Test Discounts: _____

Bench Problem

Sensor		Alarm Points Reqd.	Set	Comments	Discounts
O_2	Low	19.5	_____		_____
	High	23.5	_____		_____
	Procedure			_____	_____
CH_4	Low	1.0	_____		_____
	High	1.5	_____		_____
	Procedure			_____	_____
CO	Low	50	_____		_____
	High	100	_____		_____
	Procedure			_____	_____
NO_2	Low	3.0	_____		_____
	High	5.0	_____		_____
	Procedure			_____	_____

Gas Box Testing

Gas	Actual In Box	Minimum Acceptable	Maximum Acceptable	Observed by Contestant	Discounts
O_2	_____	_____	_____	_____	_____
CH_4	_____	_____	_____	_____	_____
CO	_____	_____	_____	_____	_____
NO_2	_____	_____	_____	_____	_____

Judges Signature_____ **Total discounts** _____

Contestant's Signature_____

BENCHMAN'S CONTEST
DRAEGER BG-4 BREATHING APPARATUS

General Rules

1. **One benchman** will be allowed for each team entered in the Mine Rescue Contest.
2. Registration will be made with the team registration.
3. The participants shall draw for working order in isolation. No switching of numbers will be allowed, unless approved by Bench Contest Director.
4. The Benchman's Contest will be held at designated locations and times over a two-day period in conjunction with the preliminary Mine Rescue Field Competitions. The teams not working the mine rescue problem will compete in the Benchman's Contest. All written testing will be conducted at the same time. Contestants

will remain in isolation until they finish the bench competition or they will be disqualified. The location of the competition will be noted. The Contest Director may waive this provision, if warranted by extenuating circumstances.

5. The bench contestants will be provided with one fully assembled BG-4, an RZ-25 tester, defogging solution, leak detector fluid, and all parts necessary to complete the problem(s). Only tools, apparatus, and testing equipment provided by the judge will be used by contestants to work the problem.
6. Total discounts of the written and monthly apparatus checks/problem diagnosis will determine the winner. In the event of a tie, total time will be the first tiebreaker. The written test will be the second tiebreaker. Third tiebreaker will be the time to find the first deficiency.
7. At the completion of the Monthly Apparatus Checks/ Problem Diagnosis, there will be a five-minute review, at which time the judge will discuss the discounts including the written test. After the review, both the judge and contestant will sign the judge's scorecard. All appeals must be in writing and submitted within one hour of the five-minute review.
8. The Bench Contest Director's ruling will be final.
9. When unplanned deficiencies are encountered in the apparatus, the judges will notify the contestants that the deficiency is not part of the problem. The contestant will turn his/her back while the judge stops the clock and corrects the deficiency. If the deficiencies are caused by the contestant, the clock will not be stopped.
10. A trophy will be awarded for first, second, third, and fourth place in the Benchman's Contest.

Written Test

1. The written test will be given while the contestants are in isolation and will consist of twenty-five true/false, multiple choice questions. The questions will be taken from Draeger's BG-4 Service Manual. The contestants will be assessed one discount point for each incorrect or unanswered question. Any alterations to the test questions or answers will be determined to be incorrect by the test judge and discounts assessed.
2. Scoring of the test will be completed by at least two qualified judges.

Monthly Apparatus Checks/Problem Diagnosis

1. Monthly checks must be performed in order from the low pressure alarm test forward and recorded. If and when deficiencies are encountered, contestants must call out to the judge and properly correct and record any and all deficiencies. Visuals can be performed at any time during the 30-minute time limit.
2. Contestants may return to correct any uncorrected deficiencies within the time limit.
3. If contestants perform checks out of order, there will be a one-time discount of five (5) points assessed.
4. Contestant will be allowed to move forward, in order, in the event a deficiency is detected but not located. Once deficiency is corrected, contestant must return to the point of deficiency and repeat all test steps in proper order.
5. If checks are performed incorrectly, checks will be discounted as not performed. For example: exhalation test performed with the dial on the RZ tester set on positive.
6. Thirty (30) minutes will be allowed to complete all checks, record and correct any and all deficiencies, and be ready to wear. There will be a five (5) minute warning given by the judge when time is about to expire.
7. Fifteen (15) discounts will be assessed for each deficiency not found.

8. Five (5) discounts will be assessed for each deficiency not corrected.
9. Five (5) discounts will be assessed for each monthly check not performed.
10. Sucking or blowing on valves with one's mouth while making checks is prohibited. There will be a ten (10) point discount assessed for each infraction.
11. For completion, the contestant must have the apparatus fully assembled with hoses connected to the face piece and attached to the apparatus and draped over the cover. If the contestant does not leave the apparatus in "ready-for-use" condition, a five (5) point discount will be assessed.

Judging

1. All judges must successfully complete a Bench training course as prescribed by the Contest Director per the apparatuses they are going to judge.
2. Judges must stand clear of the contestants.
3. Prior to and between each contestant, the judges shall perform monthly apparatus checks and correct any and all unplanned deficiencies.
4. When unplanned deficiencies are encountered, judges shall stop the clock, instruct contestants to turn his/her back to the bench area, at which time the judge will correct the deficiencies. Judges shall instruct contestants that upon turning back to face the apparatus, the clock will start. If the deficiencies are caused by the contestant, the clock will not be stopped.

BENCHMAN'S CONTEST - DRAEGER BG-4
Judges' Working Scorecard

Apparatus Serial #	
Test Date	
Visual Inspection	
Low Pressure Alarm (Negative Pressure Warning)	
Inhalation Valve	
Exhalation Valve	
Drain Valve	
Positive Pressure Leak	
Relief Valve	
High Pressure Leak Test	
Constant Metering (Dosage)	
Minimum Valve	
Bypass Valve	
Residual Warning	
Battery Check	
Test OK (initials)	
Replacement Parts	
Ready for Use	

Team No. _____

Bench Person _____

Company _____

Time

0 Bug _____

1st Bug _____

2nd Bug _____

3rd Bug _____

4th Bug _____

5th Bug _____

Time to Complete Problem

Min _____ Sec _____

Summary of Discounts

Written test questions incorrect:
1 discount x _____ = _____

Monthly check not performed:
5 discounts x _____ = _____

Monthly checks out of order:
5 discounts (total) _____

Deficiency (bug) not found:
15 discounts x _____ = _____

Deficiency (bug) not corrected:
5 discounts x _____ = _____

Sucking/Blowing Valves:
10 discounts x _____ = _____

Apparatus not "Ready for Use":
5 discounts (total) _____

Total Discounts _____

Judge _____

Judge _____

BENCHMAN'S CONTEST - DRAEGER BG-4
Bench Person's Blank Testing Card

TEST PROCEDURES	

Team No. _____

Bench Person _____

Company _____

Problems Found	Corrected
0 Bug	_____
1st Bug	_____
2nd Bug	_____
3rd Bug	_____
4th Bug	_____
5th Bug	_____

_____

Judge's Signature

_____

Bench Person's Signature

TESTING PROCEDURE
DRAEGER BG-4 BREATHING APPARATUS

STEP	TESTER SETTING	PROCEDURE HINTS
1. Visual Inspection		Check for good condition.
2. Insert O Cylinder		Fully Charged.
3. Insert Canister		Factory Sealed or Reusable.
4. Facepiece and Hoses		Check for good condition.
5. Low pressure warning	Pos. Pres. Pumping	Watch pressure gauge, activation should sound at 1.25 mbar.
6. Inhalation Valve	Pos. Pres. Pumping	Pinch exhalation hose – 10 mbar indicated on gauge.
7. Exhalation Valve	Neg. Pres. Pumping	Pinch inhalation hose – 10 mbar indicated on gauge.
8. Drain Valve	Pos. Pres. Pumping	Pump until 10mbar is indicated on gauge. Fit sealing cap over tappet of relief valve as bag inflated. Drain valve must not open at 10 mb.
9. Leak Test	Leak Test	Reduce Pres. to 7 mbar pressure should not change by more than 1 mbar in 1 minute.
10. Relief Valve	Pos. Pres. Pumping	Pump until relief valve opens. Opening pressure, should lie between 2 & 5 mbar.

(Alternate Relief Valve Test, can be performed after Step 14.)

STEP	TESTER SETTING	PROCEDURE HINTS
11. High Pressure Leak	Leak Test	Open cylinder valve. Alarm sounds once. CCR (Close Cylinder). Alarm sounds once, green indicator flashes. OCR (Open Cylinder).
12. Constant Metering Valve	Pos. Pres. Pumping	Inflate breathing bag. Fit sealing cap over tappet of relief valve.
	Dosage .05-2 L/min	Constant metering dosage should lie between 1.5 and 1.9 L/min.
13. Minimum Valve	Neg. Pres. Pumping	Pump slowly until minimum valve is opening. Minimum Valve should open between 0.1 and 2.5 mbar.
14. Bypass Valve	Leak Test	Press red button. Breathing bag inflates.
(Alternate Relief Valve Test)		Observe Reading on Rz, relief valve should open between 2 and 5 mbar.
15.	Low Pressure Warning	Close cylinder valve. Warning sounds at 700 psi.
16.	Battery Check	If Failing: Alarm sounds 5 Times. Red indicator flashes for 30 sec. **Bat** is displayed.

PROCEDURES FOR GETTING UNDER OXYGEN
DRAEGER BG-4 BREATHING APPARATUS

Procedures for getting under oxygen:

1. Prior to donning the apparatus, make sure a filled cylinder, a fresh soda lime pack, and an ice block for the breathing air cooler are installed. Don the apparatus and adjust the harness and belt.
2. Don the facepiece by spreading the head harness with hands; put chin into chin support and pull harness over the head. Tighten the chin straps first, then the temple straps, and then the top head strap. The facepiece must be sufficiently tight on the face to prevent leakage of the breathing air which could shorten the duration of the apparatus.
3. Plug the breathing connector into the facepiece until it locks in place. Pull to verify it is secure.
4. Open cylinder valve fully.
5. Check the digital pressure gauge to see that a sufficient oxygen supply remains. The green LED light should be displayed. Press the by-pass valve to check the by-pass valve operation.
6. Check the facepiece tightness by tightly closing both breathing hoses and inhaling. The facepiece should collapse against the face, indicating there are no leaks.
7. Each team member and apparatus should be rechecked by the team captain. The team captain and apparatus should be rechecked by a team member.

Items to be checked prior to going underground and at 20 minute intervals:

1. Visually check apparatus.
2. Check pressure gauge.
3. Question member as to member's ability to continue.

BENCHMAN'S CONTEST
DRAEGER BG-174A BREATHING APPARATUS

General Rules

1. One benchman will be allowed for each team entered in the Mine Rescue Contest.
2. Registration will be made with the team registration.
3. The participants shall draw for working order in isolation. No switching of numbers will be allowed, unless approved by Bench Contest Director.
4. The Benchman's Contest will be held at designated locations and times over a two-day period in conjunction with the preliminary Mine Rescue Field Competitions. The teams not working the mine rescue problem will compete in the Benchman's Contest. All written testing will be conducted at the same time. Contestants will remain in isolation until they finish the bench competition or they will be disqualified. The location of the competition will be noted. The Contest Director may waive this provision, if warranted by extenuating circumstances.
5. The bench contestants will be provided with one fully assembled BG-174A, an RZ-25 tester, defogging solution, leak detector fluid, and all parts necessary to complete the problem(s). Only tools, apparatus, and testing equipment provided by the judge will be used by contestants to work the problem.

6. Total discounts of the written and monthly apparatus checks/problem diagnosis will determine the winner. In the event of a tie, total time will be the first tie breaker. The written test will be the second tie breaker. Third tie breaker will be the time to find the first deficiency.
7. At the completion of the Monthly Apparatus Checks/ Problem Diagnosis, there will be a five-minute review, at which time the judge will discuss the discounts including the written test. After the review, both the judge and contestant will sign the judge's scorecard. All appeals must be in writing and submitted within one hour of the five-minute review.
8. The Bench Contest Director's ruling will be final.
9. When unplanned deficiencies are encountered in the apparatus, the contestants will be notified by the judges that the deficiency is not part of the problem. The contestant will turn his/her back while the judge stops the clock and corrects the deficiency. If the deficiencies are caused by the contestant, the clock will not be stopped.
10. A trophy will be awarded for first, second, third, and fourth place in the Benchman's Contest.

Written Test

1. The written test will be given while the contestants are in isolation and will consist of twenty-five true/false, multiple choice questions. The questions will be taken from Draeger's BG-174A Test, Maintenance, and Troubleshooting Manual. The contestants will be assessed one discount point for each incorrect or unanswered question. Any alterations to the test questions or answers will be determined to be incorrect by the test judge and discounts assessed.
2. Scoring of the test will be completed by at least two qualified judges.

Monthly Apparatus Checks/Problem Diagnosis

1. Monthly checks must be performed in order from the exhalation valve test forward and recorded. If and when deficiencies are encountered, contestants must call out to the judge and properly correct and record any and all deficiencies. High and medium pressure leak checks must be performed while the oxygen is in the on position (after the pre-flush test); visuals can be performed at any time during the 30-minute time limit.
2. Hoses must be connected to the RZ-25 tester and the breathing apparatus prior to any repair work, other than visual examination.
3. Contestants may return to correct any uncorrected deficiencies within the time limit. The monthly apparatus checks will be those found on page 135 of MSHA Training Module 2004. The Oxygen Control Assembly Number and the Demand Valve Assembly Number will not be required to be recorded.
4. If contestants perform checks out of order, there will be a one-time discount of five (5) points assessed.
5. If checks are performed incorrectly, checks will be discounted as not performed. For example: exhalation test performed with the dial on the RZ tester set on positive.
6. Thirty (30) minutes will be allowed to complete all checks, record and correct any and all deficiencies, and be ready to wear. There will be a five (5) minute warning given by the judge when time is about to expire.
7. Fifteen (15) discounts will be assessed for each deficiency not found.
8. Five (5) discounts will be assessed for each deficiency not corrected.
9. Five (5) discounts will be assessed for each monthly check not performed.
10. Sucking or blowing on valves with one's mouth while making checks is prohibited. There will be a ten (10) point discount assessed for each infraction.

11. For completion, the contestant must have the apparatus fully assembled with hoses attached to face piece and connected to the apparatus and draped over the cover (ready to wear). If the contestant does not leave the apparatus in "ready-for-use" condition, a five (5) point discount will be assessed.

Judging

1. All judges must successfully complete a Bench training course as prescribed by the Contest Director per the apparatuses they are going to judge.
2. Judges must stand clear of the contestants.
3. Prior to and between each contestant, the judges shall perform monthly apparatus checks and correct any and all unplanned deficiencies.
4. When unplanned deficiencies are encountered, judges shall stop the clock, instruct contestants to turn his/her back to the bench area, at which time the judge will correct the deficiencies. Judges shall instruct contestants that upon turning back to face the apparatus, the clock will start. If the deficiencies are caused by the contestant, the clock will not be stopped.

BENCHMAN'S CONTEST - DRAEGER BG-174A
Judges' Working Scorecard

Apparatus Serial #	
Test Date	
Visual Inspection	
Cylinder Pressure	
Canister/Regenerative, Refillable filled Fact. Sealed? Exp.?	
Facepiece and Hoses	
Exhalation Valve	
Inhalation Valve	
Relief Valve (opens +10 to +40 mm)	
Pos. Pressure Leak Test	
Neg. Pressure Leak Test	
Preflush	
Gauge Equalization	
Breathing Bag Volume Test	
Lung Demand Valve	
By-pass	
Dosage test (1.4 to 1.7 mbar)	
Whistle Activation	
Whistle Duration (20 to 60 seconds)	
Pres. Gage Shutoff	
High & Med. Pres. Leaks	
Test OK (initials)	
Replacement Parts	
Ready for Use	

Team No. _____

Bench Person _____

Company _____

Time

0 Bug _____

1st Bug _____

2nd Bug _____

3rd Bug _____

4th Bug _____

5th Bug _____

Time to Complete Problem

Min _____ Sec _____

Summary of Discounts:

Written test questions incorrect:
1 discount x _____ = _____

Monthly check not performed:
5 discounts x _____ = _____

Monthly checks out of order:
5 discounts (total) _____

Deficiency (bug) not found:
15 discounts x _____ = _____

Deficiency (bug) not corrected:
5 discounts x _____ = _____

Sucking/Blowing Valves:
10 discounts x _____ = _____

Apparatus not "Ready for Use":
5 discounts (total) _____

Total Discounts _____

Judge _____

Judge _____

BENCHMAN'S CONTEST - DRAEGER BG-174A
Bench Person's Blank Testing Card

TEST PROCEDURES	

Team No. _____

Bench Person _____

Company _____

Problems Found	Corrected
0 Bug	_____
1st Bug	_____
2nd Bug	_____
3rd Bug	_____
4th Bug	_____
5th Bug	_____

_____

Judge's Signature

_____

Bench Person's Signature

TESTING PROCEDURE
DRAEGER BG-174A BREATHING APPARATUS

STEP	TESTER SETTING	PROCEDURE HINTS
1. Visual Inspection		Check for good condition.
2. Insert O_2 Cylinder		Fully charged
3. Insert Regen. Canister		Factory-sealed for rescue/ refillable for training.
4. Facepiece and Hoses		Check for good condition.
5. Exhalation Valve	Zero Adjust	Cap off exhalation hose. Connect inhalation hose to exhalation valve.
	Neg. Pres. Pumping	Bag should not begin to deflate after 5 seconds
6. Inhalation Valve		Connect inhalation hose to inhalation valve (saliva trap should be vertical).
	Pos. Pres. Pumping	Bag should not begin to inflate after 5 seconds.
7. Relief Valve		Connect exhalation hose to exhalation valve.
	Pos. Pres. Pumping	Fill bag. Relief valve should open between +10 and +40 mm H_2O (+1 and +4 mbar).
(Alternate Relief Valve Test, can be performed after Step 10.)		
8. Pos. Pres. Leak		Plug relief valve and whistle.
	Pos. Pres. Pumping	Pump up to +100 mm H_2O (+10 mbar).
	Leak Test	Bleed needle down to +70 mm H_2O (+7 mbar). Start stopwatch, observe meter for 60 seconds. Should not drop more than 10 mm H2O (1 mbar).

STEP	TESTER SETTING	PROCEDURE HINTS
9. Neg. Pres. Leak		Remove plug from relief valve only.
	Neg. Pres. Pumping	Pump down to -100 mm H_2O (-10 mbar).
	Leak Test	Bleed needle up to -70 mm H_2O (-7 mbar). Start stopwatch, observe meter for 60 seconds. Should not drop more than 10 mm H_2O (1 mbar).
10. Preflush/Pressure Gauge Equalization		Remove plug from whistle.
	Neg. Pres. Pumping	Open O_2 cylinder valve. Bag should completely inflate. Compare gauge readings.
	Neg. Pres. Pumping and Leak Test	
(Alternate Relief Valve Test)		Open cylinder valve. Relief valve should open between +10 and +40 mm H_2O (+1 and +4 mbar).
11. Lung Demand Valve/Breathing Bag Volume	Neg. Pres. Pumping	Pump and count strokes. Should be at least 10 strokes before demand valve opens. Valve should open between -10 and -40 mm H_2O (-1 and -4 mbar).

STEP	TESTER SETTING	PROCEDURE HINTS
12. By-pass/Constant Dosage	Red Dosage Test (0.5 to 2 LPM)	Plug relief valve vent. Press by-pass valve until needle reads 1.7 LPM on outside red scale. Needle should settle between 1.4 and 1.7 LPM (at sea level).
13. Whistle Activation		Remove plug from relief valve vent. Close O_2 cylinder valve. Observe chest gauge. Whistle should sound at 20 to 25 percent of full cylinder pressure.
14. Whistle Duration/ Pressure Gauge Shutoff	Neg. Pres. Pumping	Lift pressure gauge shutoff lever. Open O_2 cylinder valve. Start stopwatch. Whistle should sound for 20 to 60 seconds. Chest pressure gauge should read zero. Return shutoff valve to down position.
15. High and Medium Pressure Leak		Cylinder valve still open. Check for leaks. Shut off valve after test.

PROCEDURES FOR GETTING UNDER OXYGEN DRAEGER BG-174A BREATHING APPARATUS

Procedures for Getting Under Oxygen:

1. Open cylinder valve fully.
2. Don the facepiece by pressing the chin against the chin support; pull the facepiece up into position; then, pull the harness over the head. Tighten the neck straps. Tighten the temple straps next.
3. Tighten the top straps last. It is essential that the facepiece fit well. A badly fitting facepiece not only endangers the wearer by the possible inward leakage of contaminated air, but also shortens the period of use of the apparatus by allowing the escape of oxygen from the closed circuit.
4. Check the facepiece tightness by tightly closing both breathing tubes and inhaling. The facepiece should collapse against the face, indicating no leaks. Maintain the tubes closed and exhale slowly and forcibly into the facepiece. Significant pressure should build up in the mask before leaking between the facepiece and the face indicating a good facepiece seal.
5. Check the pressure gauge to see that a sufficient oxygen supply remains. Press by-pass valve momentarily and observe the chest gauge. If the pressure drops and the whistle blows, the O_2 group is restricted and the unit is not in a useable condition.
6. Each team member and apparatus should be rechecked by the team captain. The team captain and apparatus should be rechecked by a team member.

Items to be Checked Prior to Going Underground and at 20-Minute Intervals:

1. Visually check apparatus.
2. Check gauge.
3. Question member as to member's ability to continue.

BENCHMAN'S CONTEST
BIOMARINE BIOPAK 240/240S
BREATHING APPARATUS

General Rules

1. One benchman will be allowed for each team entered in the Mine Rescue Contest.
2. Registration will be made with the team registration.
3. The participants shall draw for working order in isolation. No switching of numbers will be allowed, unless approved by Bench Contest Director.
4. The Benchman's Contest will be held at designated locations and times over a two-day period in conjunction with the preliminary Mine Rescue Field Competitions. The teams not working the mine rescue problem will compete in the Benchman's Contest. All written testing will be conducted at the same time. Contestants will remain in isolation until they finish the bench competition or they will be disqualified. The location of the competition will be noted. The Contest Director may waive this provision, if warranted by extenuating circumstances.

5. The bench contestants will be provided with one fully assembled BioPak 240/240S, a Test/Service Kit, defogging solution, leak detector fluid, and all parts necessary to complete the problem(s). Only tools, apparatus, and testing equipment provided by the judge will be used by contestants to work the problem.
6. Total discounts of the written and monthly apparatus checks/problem diagnosis will determine the winner. In the event of a tie, total time will be the first tiebreaker. The written test will be the second tiebreaker. Third tiebreaker will be the time to find the first deficiency.
7. At the completion of the Monthly Apparatus Checks/Problem Diagnosis, there will be a five-minute review, at which time the judge will discuss the discounts including the written test. After the review, both the judge and contestant will sign the judge's scorecard. All appeals must be in writing and submitted within one hour of the five-minute review.
8. The Bench Contest Director's ruling will be final.
9. When unplanned deficiencies are encountered in the apparatus, the judges will notify the contestants that the deficiency is not part of the problem. The contestant will turn his/her back while the judge stops the clock and corrects the deficiency. If the deficiencies are caused by the contestant, the clock will not be stopped.
10. A trophy will be awarded for first, second, and third place in the Benchman's Contest.

Written Test

1. The written test will be given while the contestants are in isolation and will consist of twenty-five true/false, multiple choice questions. The questions will be taken from BioMarine BioPak 240/240S Benchman Instruction Manuals and the BioPak 240/240S Operations and Training Manual. The contestants will be assessed one

discount point for each incorrect or unanswered question. Any alterations to the test questions or answers will be determined to be incorrect by the test judge and discounts assessed.

2. Scoring of the test will be completed by at least two qualified judges.

Monthly Apparatus Checks/Problem Diagnosis

1. Monthly checks must be performed in order from the visual inspection forward and recorded. If and when deficiencies are encountered, contestants must call out to the judge and properly correct and record any and all deficiencies.
2. Prior to stopping the clock; Turn-Around Maintenance Tag must be connected to the cylinder valve, hoses must be connected together with the hose coupling, back cover on and latched. Anti-fog agent must be applied to the mask lens. Apparatus serial number is required.
3. Contestants may return to correct any uncorrected deficiencies within the time limit.
4. If contestants perform checks out of order, there will be a one-time discount of five (5) points assessed.
5. If checks are performed incorrectly, checks will be discounted as not performed. For example: balloon inflated without test key installed.
6. Thirty (30) minutes will be allowed to complete all checks, record and correct any and all deficiencies, and be ready to wear. There will be a five (5) minute warning given by the judge when time is about to expire.
7. Fifteen (15) discounts will be assessed for each deficiency not found.
8. Five (5) discounts will be assessed for each deficiency not corrected.
9. Five (5) discounts will be assessed for each monthly check not performed.

10. Sucking or blowing on valves with one's mouth while making checks is prohibited. There will be a ten (10) point discount assessed for each infraction.
11. For completion, the contestant must have the apparatus fully assembled, cover in place with hoses connected, facemask on top of the apparatus (ready to wear), before stopping the clock. If the contestant does not leave the apparatus in "ready-for-use" condition, a five (5) point discount will be assessed.

Judging

1. All judges must successfully complete a Bench training course as prescribed by the Contest Director per the apparatuses they are going to judge.
2. Judges must stand clear of the contestants.
3. Prior to and between each contestant, the judges shall perform monthly apparatus checks and correct any and all unplanned deficiencies.
4. When unplanned deficiencies are encountered, judges shall stop the clock, instruct contestants to turn his/her back to the bench area, at which time the judge will correct the deficiencies. Judges shall instruct contestants that upon turning back to face the apparatus, the clock will start. If the deficiencies are caused by the contestant, the clock will not be stopped.

BENCHMAN'S CONTEST - BIOMARINE
BIOPAK 240/240S
Judges' Working Scorecard

Apparatus Serial #	
Test Date	
Visual Inspection	
Plumbing Leak Test	
Constant Flow Test 1.6 - 2.4	
Breathing System Leak Test	
Ready for Use	

Team No. _____

Bench Person _____

Company _____

	Time
0 Bug	_____
1st Bug	_____
2nd Bug	_____
3rd Bug	_____
4th Bug	_____
5th Bug	_____

Time to Complete Problem
Min _____ Sec _____

Summary of Discounts:

Written test questions incorrect:
1 discount x _____ = _____

Monthly check not performed:
5 discounts x _____ = _____

Monthly checks out of order:
5 discounts (total) _____

Deficiency (bug) not found:
15 discounts x _____ = _____

Deficiency (bug) not corrected:
5 discounts x _____ = _____

Sucking/Blowing Valves:
10 discounts x _____ = _____

Apparatus not "Ready for Use":
5 discounts (total) _____

Total Discounts _____

Judge _____

Judge _____

BENCHMAN'S CONTEST - BIOMARINE
BIOPAK 240/240S
Bench Person's Blank Testing Card

TEST PROCEDURES	

Team No. _____

Bench Person _____

Company _____

Problems Found	Corrected
0 Bug	_____
1st Bug	_____
2nd Bug	_____
3rd Bug	_____
4th Bug	_____
5th Bug	_____

_____
Judge's Signature

_____
Bench Person's Signature

TESTING PROCEDURE

BIOMARINE BIOPAK 240/240S BREATHING APPARATUS

STEP	EQUIPMENT	PROCEDURE HINTS
1. Visual Inspection		Visually inspect the entire BioPak 240/240S for worn, loose or missing parts, and parts that could fail under use.
2. Plumbing High Pressure Leak Test	Tongue Depressor Leak Tec	Install fully charged cylinder. Remove breathing chamber lid and CO_2 scrubber. Hold diaphragm away from demand valve with tongue depressor. Open O_2 cylinder valve. Check each plumbing joint with leak tec.
3. Constant Flow Test	Tongue Depressor Flow Meter	Slip the flowmeter over the flow restrictor. Hold diaphragm away from demand valve with tongue depressor. Open O_2 cylinder valve. Flow should be 1.6 - 2.4 Lpm
4. Breathing System Leak Test	Leak Test Fixture Pressure Test Knob	Connect leak test fixture to hoses. Insert pressure test knob into the hole in back of unit and turn ¼ turn to lock in place. Open O_2 cylinder valve, depress by-pass to inflate balloon. Close cylinder valve, depress by-pass to vent internal pressure. Vent pressure at test fixture until balloon reaches approximately 45 degree. Time for two minutes looking for significant drop in balloon.

PROCEDURES FOR GETTING UNDER OXYGEN
BIOMARINE BIOPAK 240/240S BREATHING APPARATUS

Procedures for getting under oxygen:

Pre-Use Inspection

1. If apparatus is stored in a ready to use condition, Turn-Around Maintenance Tag attached to oxygen cylinder valve (date less than one year old). Before donning the apparatus install frozen Gel Tube Insert into cooling canister, secure lid.
2. If apparatus is not stored in a ready to use condition, prior to donning the apparatus, complete the periodic long term maintenance procedures as outline in the BioPak 240/240S Operation and Maintenance Manual. Refill and install the CO_2 absorbent canister (LimePak dated with-in one year). Install a frozen Gel Tube Insert into cooling canister, secure lid.

Donning, 6Getting under Oxygen

1. Don the apparatus, tighten shoulder straps, buckle and adjust waist strap, connect and adjust chest strap.
2. Place facemask harness over head, center chin in chin cup, hold facemask to face and snug bottom (chin) straps first, then the upper (temple) straps, and then the top (head) strap. A poor facemask seal will cause a significant decrease in duration.
3. Perform negative pressure check by blocking the inhalation port with hand and inhaling. If you cannot inhale, mask fit is good and exhalation valve is OK.
4. Perform positive pressure check by covering the exhalation port with hand and exhaling. Mask should push away from face. If air does not escape, mask fit is good and inhalation valve is OK.

5. Remove hose coupler or red caps; connect inhalation hose and then exhalation hose to mask. Open oxygen cylinder valve fully counterclockwise and back ¼ turn. Note whistle chirp.

   Option: Hoses connected to the facepiece prior to donning.

   a. Don facemask as outlined above (item 2).
   b. Open cylinder valve fully counterclockwise and back 1/4 turn. Note whistle chirp.
   c. Perform negative pressure check by pinching off the inhalation hose and inhaling. If the wearer cannot inhale, mask fit is good and exhalation valve is OK.
   d. Perform positive pressure check pinching off the exhalation hose and exhaling. Mask should push away from face. If air does not escape, mask fit is good and inhalation valve is OK.

6. Check chest-mounted pressure gauge, 2700 - 3000 psi. within one minute.
7. The team captain should recheck each team member and apparatus. A team member should recheck the team captain and apparatus.

Items to be checked before going underground and at 20-minute intervals.

1. Visually check apparatus.
2. Check chest mounted pressure gauge.
3. Question member as to member's ability to continue.

NATIONAL METAL AND NONMETAL FIRST AID CONTEST

General Rules

1. The First Aid team must furnish the basic first aid supplies needed to complete the problem unless specified by the contest coordinator that the supplies will be available at a specific station.
2. All material used to solve the first aid problem will be picked up by the team prior to moving on to their next prospective station.
3. CPR and abdominal thrusts will only be performed on a manikin.
4. Any violations of the general rules not covered in the discount sheets will result in ten (10) discounts for each infraction.

Guidelines and Procedures

1. The First Aid Contest will consist of first aid problems and a written examination.
2. One first aid team will be allowed to compete for each mine rescue team entered in the Mine Rescue Contest.
3. The first aid team will consist of three members of the mine rescue team. If the team wishes to have an alternate available, then the alternate must take the written examination. The alternate's score on the examination will not count unless the alternate actually participates.
4. Team positions will be drawn at the beginning of each day while the first aid teams are in isolation.
5. All first aid team members will attend a briefing while in isolation and will remain in isolation until their team name is called.
6. If participating teams need additional help, such as transporting or moving a patient, help will be provided by contest officials.

7. There will be a minimum of two (2) judges at each of the first aid stations.
8. Judges will be assigned specific tasks to be scored prior to the judging and will record their findings on a specific scoring card issued prior to the contest.
9. Judges must be current in first aid methods and knowledgeable in the station they will be judging.
10. There will be three (3) separate first aid stations (not necessarily in any order).
    a. Patient assessment, artificial respiration, CPR.
    b. Patient assessment, control of bleeding, and physical shock.
    c. Wounds, burns, and scalds, musculoskeletal injuries, and transportation.
11. When the team receives the first aid scenario the clock will be started.
12. Judges must keep an accurate time and record it on scoring sheets for tie breaker purposes. First tie breaker will be field scores on all stations, second tie breaker will be scores on written test, and third tie breaker will be total time on field scores.
13. Judges will not discuss any first aid problem with contestant teams unless there are technical problems.
14. Only judges, contest officials, escorted photographers, and news media approved by the contest director will be permitted in the first aid stations.
15. On the day prior to the contest, a meeting will be held to discuss officials' and judges' assignments and training. All personnel who will be officiating during the contest shall attend this meeting.
16. The Sixth Edition of Brady "First Responder," Chapters: 4, 5, 6, 7, 8, 9, 10, 11 and 12, the published rules, and the interpretations of the discount sheet are hereby authorized for reference and guidance.
17. The team will not be permitted to use first aid manuals for reference purposes during the problem solving or between working stations.

18. There will be no simulations on the patient. All dressings and splints must be placed properly.
19. Team members are not allowed to leave the working area to obtain materials for the problem.
20. Stimulants will not be given to any patient.
21. When digital pressure is applied to the proper pressure point, bleeding will be considered under control and acknowledged by the judge.
22. Rough treatment of patient is not allowed.
23. If a tourniquet is required in First Aid problem, do not secure tightly.
24. Assistance in treatment from a supposedly unconscious patient is not allowed.
25. Teams failing to complete problems at stations 2 and 3 in the specified times will be discounted.
26. The winning six teams will be announced during the banquet.
27. Following the awarding of the trophies and plaques, team rankings will be available to the teams. The results from each station of the contest will be given to the teams at the earliest possible time.

Written Test

1. The written test will be given while the contestants are in isolation and will consist of twenty-five (25) true/false and multiple choice questions. The questions will be taken from the Sixth Edition of Brady "First Responder", Chapters: 4, 5, 6, 7, 8, 9, 10, 11 and 12. The contestants will be assessed one (1) discount point for each incorrect or unanswered question. Any alterations to the test questions or answers will be determined to be incorrect by the test judge and discounts assessed.
2. Scoring of the test will be completed by at least two qualified judges.

3. In special circumstances, individual team members may be given oral instead of written tests by one or more judges. Requests for consideration shall be presented to the Contest Director at the time of registration. All other team members will take the test at the same time.

Appeals

1. Upon completion of the examination of the patient by the judges at each station, the team shall be informed of any infractions regarding treatment while at the station. The team will be permitted to verbally appeal any infractions either with the field judge or the chief judge. If not resolved, the chief judge will make the final decision until an appeal can be filed by the team.
2. During the verbal appeal process, all questionable splints/dressings shall remain intact until the appeal is resolved. If any questionable splints/dressings are removed or altered by the team prior to being resolved, the appeal shall not be allowed.
3. Teams will have 15 minutes after being notified to report to the area designated for 20 minute looks. The team shall have 20 minutes for reviewing the judges scorecards and an additional 60 minutes to prepare and submit any appeals. All appeals shall be in writing and shall clearly state the team's comments to the discount in question. All appeals will be considered by the Final Appeals Committee and a decision will be binding and final.

Discounts

1. Discounts will not be added to the team score once the judges have signed their discount sheets following a review with team members. This does not preclude changes due to administrative errors or a misapplication of a rule.
2. Teams shall not be discounted more than once for any one mistake in the same problem where such mistake may qualify under more than one discount. Judges will confer and assess the highest single discount.
3. Teams shall be additionally discounted for repetition of the same mistakes in the same problem. For example; improper bandaging on two separate wounds (2 times the appropriate discount), three granny knots (3 times the appropriate discount), etc.
4. Teams shall not be discounted for doing more than the problem calls for, unless it is detrimental to the patient or improper care.
5. If the discount is not listed on the discount sheet and if it is not covered under one of the approved rules of the contest, judges will not improvise a discount to cover the suspected violation.

METAL AND NONMETAL FIRST AID CONTEST

Judges' Discount Card

Station #1
Cardiopulmonary Resuscitation (CPR)
Artificial Respiration
Foreign Body Obstructed Airway - Unconscious Victim

Team Name: _____ Team Number: _____
Team Members: Captain _____
_____
_____

Date: _____

A. One Rescuer CPR	**Discounts**
1. Not checking accident scene to assure personal safety	5 x ___ = _____
2. Not taking body substance isolation (BSI) precautions	2 x ___ = _____
3. Not determining unresponsiveness	1 x ___ = _____
4. Not calling for help	1 x ___ = _____
5. Not opening airway	2 x ___ = _____
6. Using head-tilt/chin-lift maneuver when modified jaw thrust should be used	2 x ___ = _____
7. Not assessing breathlessness	1 x ___ = _____
8. Not giving 2 breaths initially	1 x ___ = _____
a. Not giving two breaths within 3-4 seconds	1 x ___ = _____
b. Not inflating lungs from 0.8 to 2 liters	1 x ___ = _____
c. Not allowing for deflation between breaths (below 0.5 liters)	1 x ___ = _____
9. Not repositioning head when airway obstruction is found	1 x ___ = _____

	Discounts
10. Not giving two breaths between compressions	1 x =
a. Not giving two breaths within 3-4 seconds	1 x ___ = _____
b. Not inflating lungs up to 2 liters	1 x ___ = _____
c. Not allowing for deflation between breaths (below 0.5 liters)	1 x ___ = _____
11. Not Checking for pulse	1 x ___ = _____
12. Improperly checking for pulse	1 x ___ = _____
13. Taking less than 5 seconds or more than 10 seconds	1 x ___ = _____
14. Not using "notch" or "nipple line" technique for proper hand position	1 x ___ = _____
15. Not making parallel axis with heels of hands	1 x ___ = _____
16. Not giving 15 compressions	1 x ___ = _____
a. Each cycle of compressions not at a rate of 80 - 100 per minute	1 x ___ = _____
b. Depth of compressions not between 1.5 to 2 inches	1 x ___ = _____
c. Not releasing compressions	1 x ___ = _____
17. Incorrect hand position	1 x ___ = _____
18. No pulse reassessment	1 x ___ = _____
19. Not reassessing pulse within 3-5 seconds	1 x ___ = _____
20. Not beginning compressions after reassessment (when required)	1 x ___ = _____
21. Interrupting CPR for more than 7 seconds (each)	1 x ___ = _____
22. Not giving compressions in 52-73 seconds	1 x ___ = _____
23. Not giving artificial ventilation when pulse is found	4 x ___ = _____
24. Not communicating and physically examining each condition found (each)	1 x ___ = _____
<u>One Rescuer CPR</u>	**Subtotal** _____

B. <u>Artificial Respiration</u> **Discounts**

1. Not checking accident scene to assure personal safety 5 x ___ = _____
2. Not taking body substance isolation (BSI) precautions 2 x ___ = _____
3. Not determining unresponsiveness 1 x ___ = _____
4. Not calling for help 1 x ___ = _____
5. Not opening airway 2 x ___ = _____
6. Using head-tilt/chin-lift maneuver when modified jaw thrust should be used 2 x ___ = _____
7. Not assessing breathlessness 1 x ___ = _____
8. Not giving 2 breaths initially 1 x ___ = _____
   a. Not giving two breaths within 3-4 seconds 1 x ___ = _____
   b. Not inflating lungs from 0.8 to 2 liters 1 x ___ = _____
   c. Not allowing for deflation between breaths (below 0.5 liters) 1 x ___ = _____
9. Not repositioning head when airway obstruction is found 1 x ___ = _____
10. Not checking for pulse 1 x ___ = _____
11. Not giving artificial ventilation when pulse is found 4 x ___ = _____
12. Improper timing of artificial ventilations (12 to 15 per minute) 2 x ___ = _____
13. Not rechecking pulse after one minute of artificial respirations 2 x ___ = _____
14. Not communicating and physically examining each condition found (each) 1 x ___ = _____

<u>Artificial Respiration</u> Subtotal _____

C. <u>Foreign Body Obstructed Airway - Unconscious Victim</u> **Discounts**

1. Not checking accident scene to assure personal safety 5 x ___ = _____

	Discounts
2. Not taking body substance isolation (BSI) precautions	2 x ___ = _____
3. Not determining unresponsiveness	1 x ___ = _____
4. Not calling for help	1 x ___ = _____
5. Not opening airway	2 x ___ = _____
6. Using head-tilt/chin-lift maneuver when modified jaw thrust should be used	2 x ___ = _____
7. Not assessing breathlessness	1 x ___ = _____
8. Not giving 2 breaths initially	1 x ___ = _____
9. Not repositioning head after initial ventilation attempt fails	2 x ___ = _____
10. Not using tongue-jaw lift, cross finger technique or finger sweep when required (each)	1 x ___ = _____
11. Not giving abdominal or chest thrust when required	2 x ___ = _____
12. Improper number (maximum of 5) or improper technique in administering abdominal or chest thrusts (off to one side, improper hand position)	2 x ___ = _____
13. Not attempting to ventilate after each series of abdominal or chest thrusts	2 x ___ = _____
14. Not assessing for breathlessness or pulse once obstruction is cleared	2 x ___ = _____
15. Not communicating and physically examining each condition found (each)	1 x ___ = _____

Foreign Body Obstructed Airway - Unconscious Victim **Subtotal** _____

Station #1 Total Discounts _____

_____
Judge

_____
Judge

_____
Scorecard Examiner

METAL AND NONMETAL FIRST AID CONTEST

Judges' Discount Card

Station #2
Patient Assessment
Control of Bleeding
Physical Shock

Team Name: _____ Team Number: _____
Team Members: Captain _____
_____
_____

Date: _____

A. Patient Assessment	**Discounts**
Primary Assessment	
1. Not checking accident scene to ensure personal safety	5 x ___ = _____
2. Not taking body substance isolation (BSI) precautions	2 x ___ = _____
3. Not administering patient assessment	25 x ___ = _____
4. Not checking unresponsiveness	1 x ___ = _____
5. Not calling for help	1 x ___ = _____
6. Not stabilizing head if spinal injury is suspected	12 x ___ = _____
7. Not placing patient in supine position	1 x ___ = _____
8. Improper turning of patient	5 x ___ = _____
9. Not assessing airway - using head-tilt/chin-lift maneuver when modified jaw-thrust should be used and visa versa	10 x ___ = _____
10. Not removing visible foreign substance from mouth	2 x ___ = _____
11. Not assessing breathing - look, listen, feel	10 x ___ = _____

		Discounts
12.	Not checking for pulse	10 x ___ = _____
13.	Improperly checking for a pulse	2 x ___ = _____
14.	Not visibly checking for profuse bleeding - state to judge that you are looking for bleeding	10 x ___ = _____
15.	Not doing primary assessment in proper sequence	15 x ___ = _____
Secondary Assessment		
16.	Not examining head (scalp, blood in hair, etc.)	2 x ___ = _____
17.	Not examining neck	2 x ___ = _____
18.	Raising head if spinal injury exists	6 x ___ = _____
19.	Not checking chest (placing hand on chest)	2 x ___ = _____
20.	Not gently feeling abdominal area	2 x ___ = _____
21.	Not gently feeling under patient (lower back) for injury	2 x ___ = _____
22.	Not checking pelvic area for injury	2 x ___ = _____
23.	Not checking genital area for obvious injury	2 x ___ = _____
24.	Not checking lower extremities for injury	2 x ___ = _____
25.	Not checking lower extremities for paralysis	2 x ___ = _____
26.	Not checking upper extremities for injury	2 x ___ = _____
27.	Not checking upper extremities for paralysis	2 x ___ = _____
28.	Not checking back surfaces for injury	2 x ___ = _____
29.	Not checking medic alert bracelets/necklace	2 x ___ = _____
30.	Checking out of order	15 x ___ = _____
31.	Work other than taking support or controlling bleeding during secondary survey	4 x ___ = _____

Patient Assessment **Subtotal** _____

B. Control of Bleeding **Discounts**

1. Not controlling arterial bleeding 20 x ___ = _____
2. Not applying direct pressure to control arterial bleeding 20 x ___ = _____
3. Ineffective indirect pressure (off pressure point, etc.) 4 x ___ = _____
4. Releasing direct or indirect pressure or elevation before bleeding is controlled 4 x ___ = _____
5. Tourniquet - Ineffective application, improperly applied or loosened during problem 4 x ___ = _____
6. Applying tourniquets when not required 4 x ___ = _____
7. Not giving any treatment for internal bleeding 4 x ___ = _____

Control of Bleeding Subtotal _____

C. Physical Shock **Discounts**

1. Not loosening tight clothing at neck, chest, and waistline, if closed (unopened belt, button, snap, or fastener) (each infraction) 1 x ___ = _____
2. Not covering patient 2 x ___ = _____
3. Improper covering of patient 1 x ___ = _____
4. Giving patient a stimulant 4 x ___ = _____
5. Not elevating foot end or head end of stretcher in required cases 1 x ___ = _____
6. Not keeping calm and not assuring the patient (emotional well being) 2 x ___ = _____

Physical Shock Subtotal _____

Failure to locate and treat any condition (each infraction) 10 x ___ = _____

Not completing problem in specified time 25 (total) _____

Station #2 Total Discounts _____

_____
Judge

_____
Judge

_____
Scorecard Examiner

METAL AND NONMETAL FIRST AID CONTEST

Judges' Discount Card

Station #3
Wounds, Burns and Scalds
Musculoskeletal Injuries
Transportation

Team Name: _____ Team Number: _____
Team Members: Captain _____
_____
_____

Date: _____

A. Wounds, Burns and Scalds	**Discounts**
1. Not applying dressing for wound or burn (each)	8 x ___ = _____
2. Not applying cover dressing (each)	4 x ___ = _____
3. Not using sterile gauze or sterile compress	1 x ___ = _____
4. Bandages improperly applied (not entirely covered, wrong location, method, or position of knot, etc.)	2 x ___ = _____
5. Failure to place gauze between fingers, toes, or back of ear (when required)	2 x ___ = _____
6. Failure to apply cold applications or elevate bruise (when practical) (each)	2 x ___ = _____
7. Not removing or indicating removal of clothing from affected area	2 x ___ = _____
8. Not rendering any treatment for rupture	6 x ___ = _____

	Discounts
9. Not simulating or indicating that gauze is moist (when required)	2 x ___ = _____
10. Failure to properly treat sucking chest wound	10 x ___ = _____
11. Not treating injuries in their proper order (according to fundamentals)	4 x ___ = _____
12. Improperly applied slings when required (each)	1 x ___ = _____

Wounds, Burns and Scalds **Subtotal** _____

B. **Musculoskeletal Injuries**	**Discounts**
1. Not rendering any treatment for a strain or sprain (each infraction)	4 x ___ = _____
2. Not treating spinal injury, fracture of pelvis or thigh (each)	12 x ___ = _____
3. Not treating fractures other than (#4) (each)	10 x ___ = _____
4. Failure to properly treat suspected skull fracture	2 x ___ = _____
5. Failure to support fractures/dislocations until properly splinted	6 x ___ = _____
6. Not properly treating dislocations (each)	8 x ___ = _____
7. Failure to properly splint	2 x ___ = _____
8. Failure to properly apply padding where needed	1 x ___ = _____
9. Lifting or rolling patient from wrong side when applying splint	2 x ___ = _____
10. Team member not kneeling on proper knee(s) (each)	2 x ___ = _____
11. Improperly lifting or rolling of patient (lifting to knee when patient has dislocated or fractured hip or spinal injury)	2 x ___ = _____
12. Failure to properly test broken-back splint	4 x ___ = _____

	Discounts
13. Improperly assembled splint/backboard	2 x ___ = _____
14. Improperly applied bandages	2 x ___ = _____
15. Improperly applied slings when required (each)	1 x ___ = _____

Musculoskeletal Injuries **Subtotal** _____

C. Preparation for Transportation	**Discounts**
1. Failure to properly test stretcher	4 x ___ = _____
2. Lifting patient from wrong side (three members on least injured side)	2 x ___ = _____
3. Team member kneeling on wrong knee (each)	1 x ___ = _____
4. Patient not placed on stretcher (when required)	2 x ___ = _____
5. Improperly applied basket sling	1 x ___ = _____

Preparation for Transportation **Subtotal** _____

Failure to locate and treat any condition (each infraction)	10 x ___ = _____
Not completing problem in specified time	25 (total) _____

Station #3 Total Discounts _____

_____
Judge

_____
Judge

_____
Scorecard Examiner

GLOSSARY OF TERMS

ACCESSIBLE - Able to be traveled into; not impassable.

ADIT - A nearly horizontal passage from the surface by which a mine is entered.

AIR LOCK - An area in the mine closed at both ends by two doors or two bulkheads. An air lock is used to prevent mixing of different atmospheres while still permitting miners to enter and exit.

AIR SHAFT - Shaft used exclusively for conducting air.

AIR SPLIT - The division of an air current into two or more parts.

AIR TRACK DRILL - A heavy drill mounted on crawler tracks.

AIRWAY - Any passage through which air is flowing.

ALTERNATE - Person qualifying to participate as a mine rescue team member. Can replace any team member who cannot continue or who is removed from the problem.

ATMOSPHERIC PRESSURE - Force exerted by air. Atmospheric pressure is measured on a barometer.

ATTENDANT - Person who assists the team at the fresh air base.

AUXILIARY FAN - A small, portable fan used to supplement the ventilation of an individual working place.

AUXILIARY VENTILATION - Portion of main ventilating current directed to face of dead-end entry by means of an auxiliary fan and tubing.

BACK FILL - The rough material used to refill a place from which the earth has been removed.

BACK/ROOF - That part of an opening which is nearest the surface in relation to any portion of the workings of the mine, the roof. Overhead surface of an underground opening.

BACKUP TEAM - The rescue team stationed at the fresh air base as a "backup" for the working team beyond the fresh air base.

BAFFLE - A device used to deflect, check or regulate the flow of air.

BARRICADE - Enclosed part of mine to prevent inflow of noxious gases from a mine fire or explosion. This may be done by doors or by building one or more airtight walls using any available materials such as rock, wood, brattice cloth, mud, clothing, etc., so as to enclose a maximum quantity of good air. If contact is not made with person behind the barricade, conditions inside the barricade will be unknown.

BARRICADING - Enclosing part of mine to prevent inflow of noxious gases from a mine fire or an explosion.

BATTERY CHARGING STATION - Area set aside for charging and storing batteries.

BATTERY LOCOMOTIVE - Battery powered machine used for moving cars within the mine.

BATTERY OPERATED EQUIPMENT - Any equipment powered by batteries.

BELT FEEDER - The dump end of a belt system. To disperse ore on the belt.

BLASTING BOX - The unit used for firing of one or more charges electrically.

BLASTING CAPS - A detonator containing a charge of detonating compound, which is ignited by electrical current or the spark of a fuse used for detonating explosives.

BOREHOLE - Any deep or long drill hole. It may be a source of air, supplies and communications in an emergency.

BORER - A device for making large holes.

BRATTICE CLOTH - Fire-resistant fabric or plastic used in a mine passage to control ventilation.

BRIEFING - Session held before a team goes underground to inform team members of conditions underground and give them their work assignment.

BULKHEAD - A wall or partition constructed across a passageway to direct the ventilating air in its proper course.

CAGE - A shaft conveyance used in hoisting personnel and materials.

CAVED - Ground which has fallen.

CAVED IMPASSABLE - Incapable of being passed, traveled, crossed, or surmounted, but allows some ventilation flow.

CAVED TIGHT - Ground caved in to prevent access and allows no ventilation flow.

CHOCKS - Wedge shaped blocks to put under vehicle wheels to prevent movement.

CHUTE/ORE PASS - Vertical or inclined passageway for downward movement of ore.

CONTINUOUS MINER - A mining machine designed to remove ore from the face and load it into cars or conveyors.

CRIB BLOCKS - Blocks used to support.

CROSSCUT - A horizontal opening driven across the direction of the main workings; a connection between the two drifts or tunnels.

CURTAIN - Brattice cloth, canvas or plastic curtain used to deflect or direct air into a working place. Constructed in a manner to allow the passage of miners and machinery.

CUTTING MACHINE - A power (electric) driven machine used to undercut ore.

DEBRIEFING - Session held when teams return to the surface after completing an assignment to review what they saw and did.

DETONATING FUSE - A round, flexible cord containing a center core of high explosives. (Primacord)

DETONATOR - A device used for detonating explosives.

DISTRIBUTION BOX - An enclosure through which electric power is carried to one or more cables from a single incoming feed line.

DOWNCAST - An opening though which fresh ventilating air is drawn or forced into the mine; the intake.

DRIFT/ENTRY - A passage underground

EXHAUST - The air course along which the air of the mine is returned or conducted to the surface.

FACE/RIB - Vertical surface of an underground opening.

FEEDER - Small cracks in rock strata from which gas escapes.

FILL - Any material that is put back in place of the extracted ore.

FLOOR - That part of any underground opening upon which one walks.

FOOTWALL - Lower side of a dipping ore body.

FRESH AIR BASE - Base of operations from which the rescue and recovery teams can advance into irrespirable atmospheres.

FRONT-END LOADER - Self-propelled machine used for moving or loading muck.

HANGING WALL - Upper side of a dipping ore body.

HOLE CHARGED - A drilled hole that is charged with explosives ready to be blasted.

IMPASSABLE - Incapable of being passed, traveled, crossed, or surmounted.

INACCESSIBLE AREAS - All areas of the mine where team travel is blocked by one of the following conditions: seals, unsafe roof (rib-to-rib) that cannot be supported or scaled, inextinguishable fires, water over knee deep, or caved impassable falls.

INCLINE/SLOPE - A non-vertical shaft, usually on the dip of a vein.

INTAKE - The passage through which fresh air is drawn or forced into a mine.

INTENSE HEAT - Air heated to the extent that it cannot be entered.

INTERSECTION - For contest work, any area driven 3 feet or more off a drift.

LAGGING - Materials used for flooring or shoring.

LEAD WIRE - Wire used to fire electric detonators.

LIFELINE - Rope, line, or cable that links the team to the fresh air base.

LINE BRATTICE - Fire-resistant fabric or plastic partition used in a mine passage to direct the air into the working place. Also termed "Line Canvas or Line Curtain."

LOADING MACHINE - A machine to load broken ore or rock.

LONG HOLE DRILL - A drill using sectional steel to drill holes to greater depths.

LOOSE BACK - Unstable overhead surface which must be controlled before entry.

LOOSE RIB - Unsupported loose ground on the side of the drift.

MAGAZINE - A storage place for explosives or for detonators.

MANDOOR - Door installed in a permanent stopping (bulkhead) to allow persons to travel from one drift to another.

MANHOLE - A refuge hole constructed in the side of a drift.

MANTRIP - A trip on which personnel are transported to and from a work area.

MINE DOOR - A large, hinged door used to close off a mine entry.

MISFIRE - The complete or partial failure of a blasting charge to explode as planned.

MOTOR - Machine usually on a track used for tramming ore or supplies.

MULTI-GAS INSTRUMENT - Gas detector capable of continuously and simultaneously measuring atmospheric concentrations of oxygen (O_2), methane (CH_4), carbon monoxide (CO) and at least one other toxic gas (e.g. nitrogen dioxide - NO_2).

ORE PASS - A vertical or inclined passage for the downward transfer of ore.

OVERCAST - Enclosed airway built at an intersection of mine passages that permits one air current to pass over another air current without mixing.

PERMISSIBLE - A machine, material, apparatus or device which has been investigated, tested and approved by MSHA for use in gassy mines.

PILLAR - A column of ore or rock left in place.

POST - A mine timber.

RAISE - A vertical or inclined opening driven upward.

RAISE CLIMBER - Equipment used in an opening (raise) that is mined upward.

REFUGE CHAMBER - An airtight, fire-resistant room in a mine used as a method of refuge in emergencies by miners unable to reach the surface.

REGULATOR - An adjustable door or opening in a stopping, used to control and adjust the quantity of airflow.

RETURN AIR - The air that has passed through the working areas of the mine.

RIB - The wall of a mine opening.

ROOF BOLTER - A machine designed to drill holes in the roof and install bolts.

ROOF BOLTS/ROCK BOLTS - A long bolt inserted and anchored in holes drilled in the rock.

ROOF JACKS - A roof support designed for immediate temporary use.

SCALING BAR - Tool with a flat point and a heel used to pry in a crack of the rock.

SEAL - A stopping built of greater thickness and more substantial construction used to isolate abandoned areas of the mine from the active workings or to isolate a fire.

SHAFT - A vertical opening of limited area compared with its depth, made for finding or mining ore, raising ore, rock or water, hoisting and lowering workers and materials, or ventilating underground workings.

SKIP - A hoisting bucket, which slides between guides in a shaft.

SLUSHER/SCRAPER - A machine for transferring or loading rock by pulling an open bottomed scoop back and forth from the face to the loading point by means of a drum hoist, cables and sheaves.

SPLIT - To divide the air current in two or more separate currents.

STOPE - An excavation in a mine, other than development workings, made for the purpose of extracting ore.

STOPER - A pneumatic hammer drill used for drilling upward.

STOPPING - A permanent or temporary wall or partition constructed across a passageway to direct the ventilating air.

STULL/PROP - Column of wood or steel used for support of underground openings.

SUMP - An excavation in the shaft or mine made below the mining level to collect mine water.

SUPPLY PLATFORM - Area set aside for storage of materials.

SURVIVOR - Person found alive in the mine.

SWITCH - An electrical switch.

TAGLINE - Short line no longer than 3 feet hooked from a team member to the team line.

TEAM LINE - Line that links team members together (extension of lifeline).

TIMBER SET - Tunnel support consisting of a roof beam or arch and two posts.

TYING ACROSS AND BEHIND - Systematic exploration of all intersecting and adjacent passageways so that the team is never forward (toward the working face) of an accessible, unexplored area.

UNDERCAST - An enclosed airway built at an intersection of mine passages that permits one air current to pass under another air current without mixing.

UPCAST - The opening through which the return air is removed from the mine. The opposite of downcast or intake.

VENT BAG - An enclosed airway to direct airflow to a given area or location.

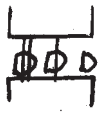
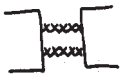
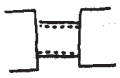
WINZE - An opening, like a small shaft, sunk from an interior point in a mine.

WORKING PLACE - Any place in or about a mine where work is being performed.

MINE MAP LEGEND

This legend must be used by all teams participating in the National Mine Rescue Contest.

	**Gas Test**	For each gas test conducted.
	**Seal**	If the seal is equipped with devices such as sampling tubes or water traps, or is damaged, leaking, or destroyed that particular device or condition is noted beside the symbol.
	**Permanent Stopping Intact**	Stopping is intact, airtight. (No indication of opening or leakage.)
	**Permanent Stopping Not Intact**	Stopping may be destroyed, partially destroyed, or have openings. Is not airtight. Condition noted on placard is to be shown on map beside symbol.
	**Temporary Stopping Intact**	Stopping is intact and airtight. This symbol is used for all structures built by the team, such as airlocks, etc.
	**Temporary Stopping Not Intact**	Stopping may be destroyed, partially destroyed, or have openings. Is not airtight. Condition noted on placard is to be shown on map beside symbol.
	**Barricade**	Any information an placard, such as leaking, damaged, destroyed, etc. shall be noted on mine map beside symbol.

	**Door**	The “D” symbol can be shown by itself, in permanent or temporary stopping. Type, size, and open or not if indicated on placard, must be indicated on map beside symbol. The curve of the “D” indicates direction of door opening.
	**Regulator**	If the regulator is damaged, leaking, or destroyed, condition must be shown on map. Also, indicate whether open (how much), or closed.
	**Fire**	Write out any information given on placard about fire, on map beside symbol.
	**Air Movement**	Show arrow in direction of movement as indicated on placard, and how any quantity, if given, or other information, such as flow velocity. Put on map beside symbol.
	**Water**	Indicate depth or any other information as shown on placard. Put on map beside symbol.
	**Caved**	Caved areas are not considered airtight unless so stated on placard. Write out any information on placard beside symbol on map.
	**Unsafe Roof Across Entry Rib-to-Rib**	Symbol used for any indication of questionable roof conditions. May or may not be scalable. Write out any other information on placard on map beside symbol.

Unsafe Roof Partially Across Entry

Symbol used for any indication of questionable roof conditions. May or may not be scalable. Write out any other information on placard on map beside symbol.

Unsafe Rib or Over-hanging Brow

Symbol used for any indication of questionable rib conditions. May or may not be scalable. Project over rib line area on map. Write out any other information on placard on map beside symbol.

Body

Indicate position of head and feet as body is found. If word "body" is on placard, show symbol. Indicate any additional information on placard on map beside symbol.

Live Person

Indicate position of head and feet as found. Write out condition, such as conscious, walking, etc. Indicate any injuries as given on placard. Write out information on map beside symbol.

Check Curtain

Condition of check, if noted on placard, must be shown on mine map beside symbol. Ex. "Partially down"

Line Brattice or Line Curtain

The full extent of curtain shall be shown. If the curtain is partially or completely down, it must be noted on the map beside the symbol.

Overcast

If it is damaged, leaking, or destroyed, that particular condition is to be noted on the map beside the symbol.

	**Undercast**	If it is damaged, leaking, or destroyed, that particular condition is to be noted on the map beside the symbol.
	**Fan**	Write out the conditions of the fan, and any other information indicated on placard, on the map beside the symbol.
	**Fan with Tubing**	Write out the conditions of the fan, tubing, vent bag or placard on the map by symbol.
	**Brattice Frames**	Indicate any information on placard on mine map beside symbol.
	**Brattice Cloth or Brattice Material**	Indicate any information on placard on mine map beside symbol.
	**Gas Mixture**	Use for any placard indicating a gas or a mix of gases in the mine atmosphere. Write out the gas name or symbol and indicate PPM or percent (%) if shown on placard.
	Smoke	Write out light, heavy, dense, or any other information indicated on placard, on map beside the symbol.
	**Elongated Object**	For use in indicating pipelines, cables, and other objects usually found that are of any length. Do not use for cable coiled, etc. Write out any other information about object on map beside symbol.
	Track	Write out any information noted on placard on map beside symbol.

	**Mobile Equipment**	Use for all mobile face equipment. Write out any other information given on placard on map beside symbol on map.
	**50 Foot or First Team Check Inby Fresh Air Base**	Used for 50 foot check of team members
	**20 Minute Apparatus Check**	Used for every 20-minute apparatus check of team members.
	**Farthest Point of Advance**	Should be used only where areas inby will not be explored for whatever reason. Not to be used where other conditions block travel.
	**Captain's Date and Initial**	Use for all locations where the team captain dated and wrote his initials.
	**Power Center**	Self explanatory - Write out any information noted on placard.
	**Other Objects, Conditions, or Equipment**	Write the name of the object, condition, or equipment and other information indicated by placard on map beside the symbol. This would include a "face" if marked by a placard.